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-Y-AUGUST. 1955

VOL. 9, No. 4

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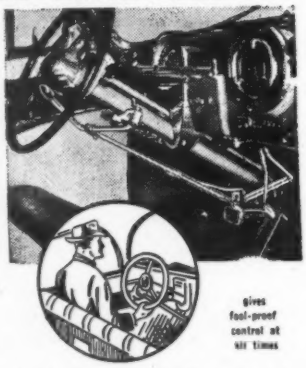

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THE JOURNAL OF THE ASSOCIATION FOR PHYSICAL AND MENTAL REHABILITATION

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THE BOSTON CONFERENCE OF 1955

EVERETT M. SANDERS*

Many progressive ideas have originated in the meeting of minds that takes place when groups assemble to look into the future and glean from the experience of the past what is best for progress and growth.

The Boston Conference of 1889 was such an event in the field of education through the physical. Out of this memorable occasion "gymnastics" or physical education became a part of the curriculum of general education. From that early acceptance by the medical profession of physical activity as essential for the well-being of youth, we have seen the development of Corrective Therapy emerge as one of the 19 ancillary therapies now in use in the physical and mental rehabilitation of both civilian and military personnel disabled by accident, disease, and that futile system of settling international controversies – War. Thus, it was fitting that The Association for Physical and Mental Rehabilitation should choose the city of Boston for one of its annual conventions and that it should select the title, "Rehabilitation – An Educational Challenge" as the conference theme.

Following two days devoted to business meetings, the conference opened on Monday, June 27 and continued until Noon, Friday, July 2. Daily sessions were very well attended and audiences evinced considerable interest in the richly varied program which featured outstanding physicians and professional personnel in the various panels. Although it is not the objective of this report to provide the details regarding the panels and professional papers presented at this meeting, an attempt will be made to highlight briefly and chronologically the 1955 conference.

The scientific and clinical sessions convened in the opening day of the convention with a panel, *A Driving Program for the Disabled.* Dr. R. R. Gasser, Manager of the West Roxbury, V. A. Hospital served as chairman of the panel. His remarks had a particular meaning to the author who so well remembers the problems faced in acquainting many of the doctors after World War II with the objectives of rehabilitation and pacifying irate citizens in neighboring communities, who could see only the hazard to life and limb when disabled veterans first operated cars with the various mechanical devices. With the driver training program of today, it is no longer "get them off the highway," for adequate education in this important phase of rehabilitation is being taught by such Corrective Therapists as Mr. Thomas Rowley of West Roxbury V. A. Hospital. In cooperation with the Registry of Motor Vehicles he is helping to enable our severely disabled, not only to enjoy the highways but also the life of the community as well.

Colonel Wm. F. Bench, Supervisor of Veteran's Facility and the Handicapped, Mass. Registry of Motor Vehicles, traced the development of *The Driving Program For the Disabled in the Commonwealth of Massachusetts* from the appearance of the first automobile on the highways of Massachusetts to the present complete program. He said, "By 1902 they (automobiles) began to create such a problem that the legislature passed the first definite law with reference to speed limits of such vehicles. In 1903, the first license and registration law was passed—there was no qualification test for operators except a statement that the operator had driven 150 miles. In 1920 all applicants had to pass an examination. It was not until 1944 that the present system for handling the license problems of the physically handicapped began."

The question and answer period following the next two speakers indicated the wide-spread interest and importance of training in operating motor vehicles as an essential phase of the rehabilitation of the handicapped.

An indication of the expansion of Corrective therapy was well illustrated in the panel on *New Horizons in the Development of a Program Designed for Treatment of TB-NP Patients.*

Charles Taffel, Ph.D., Chief Psychology Unit N.P.-T.B. Service, Brockton, V.A. Hospital, made this significant statement—"in prescribing a treatment, we consider both psychiatric goals and goals in relation to tuberculosis." He gave the following reasons for referring this type of patient to Corrective Therapy.

1. Hyperactivity that interferes with receiving adequate rest and nourishment.

2. Assaultive behavior that interferes with the activities of other patients.

3. Social regression to the extent that the patient seems unable to participate in any other P.M.R.S. activities.

4. Seclusive preoccupied patients who require constant stimulation in an attempt to break through the barrier they set up to defend themselves.

The corrective therapists, while carrying out such activities as will produce specific results, are charged

*Editor Emeritus, *Journal of the Association for Physical and Mental Rehabilitation.*

with accomplishing the general goals that result from all other therapeutic approaches by the entire hospital staff. It is an organized team approach.

The next paper, by Kenneth Dening, Chief Corrective Therapy, Brockton, Mass., V.A. Hospital, described the program as experimental for the reason that there was "no authoritative literature on which to base a program." He stated, "There is no positive proof that these assignments are not beneficial in treating patients psychiatrically as they are being treated for their tuberculosis."

Four psychiatric classifications are treated:

A. Psychiatrically disturbed and regressed patients with active TB.
B. Psychiatrically disturbed and regressed with inactive TB.
C. Patients with active TB whose behavior is psychiatrically good.
D. Patients with inactive TB whose psychiatric behavior is poor.

The program at present is centered on group "C". Discussion indicated that this program is producing highly desirable results, marking a departure from the former emphasis on bed rest.

Tuesday was one of those days that come in every convention. From the opening Panel on *A Therapeutic Aquatic Program*, to the evening meeting of the General Assembly, there was little time even for meeting of old friends and co-workers for those intimate exchanges so enjoyed by all delegates. Wesley G. Woll, Jr., M.D., chairman of the panel, opened the session with a survey of hydro and pool therapy from antiquity to the present – a fitting introduction to a discussion on one of the established forms of therapy so familiar to the corrective therapist. An informative paper on *The Utilization of Therapeutic Pools in the Treatment of Orhopedic Disabilities*, by Major Henry Rockstroh, M.S.C., brought out the importance of mastery of the fundaments of swimming not only for safety, but also for developing a feeling of relaxation and exhilaration in water, not a natural habitat of man. These find movement much less painful than frequently anticipated, becoming motivated to move painful joints more often.

William E. Cully, Chief Corrective Therapy V.A. Hospital, Coatesville, Penn., presented the next paper on *A Therapeutic Pool Program for Acutely Disturbed Psychotic Patients*. He described the two "hydrogyms" now in use at Coatesville. The safety factor of a special type of pool construction gives both patient and therapist a facility, the nature of which approaches the ideal in a teaching situation. Such pools impose no restrictions on the swimmer and allow proper supervision and maximum safety for all. Temperatures are maintained at 96° F. which provides vasodilation of peripheral vessels and muscular relaxation. A detailed account of the activity from the cleansing shower and invitation to enter the water to the concluding shower to end the period was presented. His was a paper replete with descriptions of the techniques necessary to cope with all types of psychotics.

The Governor's Luncheon was an innovation in keeping with the well-planned program of the entire convention and left nothing to be desired.

The formal opening of the convention, especially the keynote address by the Lieutenant Governor of Massachusetts, Sumner D. Whittier, on the theme of the convention, *Rehabilitation: An Educational Challenge*, was one of the highlights of the meeting.

As one listened to the addresses of welcome, President Mantovano's response, and the keynote address, the quality of the thoughts expressed, showing the nation wide interest in physical and mental rehabilitation, one felt a new enthusiasm and uplift that brought into bold relief the opportunities to restore independence and happiness back home in the community.

The symposium *An Integrated Approach to the Treatment and Rehabilitation of Rheumatoid Arthritis* was a well coordinated presentation by William J. Shriber M.D. Chief, P.M.R.S. Beth Israel Hospital, Theodore Potter M.D., Instructor in Orthopedic Surgery, Boston University Medical School, and J. Sydney Stillman, M.D., Instructor in Medicine, Harvard University, School of Medicine. We were given one of the most comprehensive discussions of this crippling disease that our membership has ever heard. Charts and slides were liberally used. A few excerpts follow:

"Rheumatoid Arthritis attacks connective tissues of the whole body—Once an arthritic always an arthritic—Never expect to be entirely well—The incidence is tremendous in the 25 to 40 age group—Women affected in the proportion of 3 to 1—All races affected—Not helped by climate.—The cause—? There are many theories—stress, acute infection, long continued emotional strain, overwork precipitate attacks—This we can do something about—We can help the victim reorganize his way of life.

The great importance of the proper combination of exercise and rest was emphasized throughout the discussion. The physical, corrective, occupational, and manual arts therapists as well as the psychologist and educational and vocational counselors all have a part in the arthritic's rehabilitation. With the arthritic, rehabilitation is a continuous, dynamic process geared to the patient's tolerance. The part played by the Corrective Therapist is most important as was shown in the topic title, *Function of the Ancillary Therapies in the Treatment of Rheumatoid Arthritis.*

In the panel that followed, *New Somatic Thera-*

pies in Psychiatry as Related to Corrective Therapy, Delilah Reimer, M.D. Chief P.M.R.S. Bedford, Mass. V.A. Hospital, described the difference between the custodial and therapeutic hospitals. In the custodial hospital the therapist sees the patient as abnormal. In the therapeutic hopital the therapist sees the patient as like himself but having difficulties. The emphasis in the therapeutic hospital, is to make it possible for the patient to get well by providing a favorable environment.

The next speaker Sidney Greenblat, M.D., Director of Research, Boston Psychiatric Hospital, read a paper on *The Contribution of New Drugs to the Therapeutic Milieu*, the essense of which was to show the difference in the types of therapist found in both types of hospitals, and indicate the part being played by the new drugs now in use. He used the word "Tanguilizers" to express the contributions these newer drugs, Thorazine and Serpasil, are making. Thorazine is a new compound developed by the French. Serpasil has been known for many years in India as the "Insanity herb." Used in moderate doses these drugs do not put patients to sleep. As in the past the use of drugs is viewed with some skepticism, but at present these two are being successfully used.

The program of Wednesday was highlighted by the symposium, *Rehabilitation of Patients with Spinal Cord Lesions*. Both paraplegia and quadriplegia were considered. Donald Munro, M.D. Neurosurgeon-in-Chief, Boston City Hospital, in his inimitable straightforward manner stated that Rehabilitation starts right after the accident. Don't move the patient until he can be properly transported. For a cervical injury, transport face down. Splint patients where they lie with newspaper, towel—anything. Use stretcher, door or shutter as a stretcher and transport to nearest *big* hospital, leaving patient on stretcher until he is in the ward.

In similar instructive manner for the remainder of his talk, he traced the treatment and progress of patients with spinal cord injuries to their discharge. Color slides showing transected cords added to the picture of the complex problems faced in the rehabilitation of these patients. Demonstrations by patients of the different phases of their rehabilitation added objectivity to the types of therapy involved.

Herbert S. Talbot, M.D., Chief Paraplegic Service, West Roxbury Hospital, followed with an excellent discussion of the many involvements resulting in dysfunctions of the body systems. It furnished a background for understanding that the problems of the decubitus ulcer, bladder and bowel control, profuse sweating or lack of it, the loss of sensation or the presence of pain in the area of paralysis, must be "viewed together and seen as a whole and except when an emergency arises, there is no justification for efforts directed at the treatment of any one, unless all the others have been considered. Nature recognizes no specialization, and the organism succeeds because the function of all its parts and systems are accurately integrated." The members of the P.M.R.S. at West Roxbury are doing an outstanding piece of work with patients with quadriplegia. Time or space permit but a brief report of this fine demonstration of coordinated departmental activity.

Perhaps the most functional phase of the quadriplegic program has been the development of devices that permit performance of many self care activities.

John G. Bisgrove, M.D. Chief P.M.R.S. at Roxbury and Vincent W. Anderson, Corrective Therapist have developed a "Finger Flexion Hand Splint". This device was demonstrated by one of the patients.

While the symposium was an outstanding demonstration of the efficacy of the staff at this centre, a similar proof of competence was behind us in the morning sessions.

The *Report of Catatonic Research* by Paul E. Roland, Chief, Research Unit, Corrective Therapy Section, Chillicothe V.A. Hospital, Ohio corroborated many of the earlier findings and developed an effective technique for dealing with what may become in the near future, one of the nation's most extensive and difficult medical and mental rehabilitation problems.

The panel discussion on *Rehabilitation of Patients with Cardiac Disease* was most informative. It was another of the panel sessions showing so well, the importance of coordination of all services of P.M.-R.S. with the medical and surgical care of patients. Dr. Bernard V. Doyle, Asst. Chief P.M.R.S., Jamaica Plain V.A. Hospital, indicated the distinction between patients with cardiac disease alone and those with cardiac disease as a complicating factor. Patients with cardiac disease with no other disability used to be kept in bed for six weeks, discharged and left on their own resources. Now, graduated exercises are started during the second week of convalescence. By the fourth week patients with myocardial infarctions are ambulating. During the fifth and sixth week, stair climbing is added. Another general consideration in prescribing activity for the patient with a cardiac condition is to use the therapeutic classification, rather than the functional, as the guide. Roscoe P. Browne, Ph.D. Director of Research Laboratory, Department of Health, Physical Education and Recreation, New York University, demonstrated with charts the difference in the reserve capacity of the normal and diseased heart. He cautioned against dependence on many of the functional tests still being used.

Alfred Ebel, M.D., Asst. Chief, P.M.R.S., Bronx

V.A. Hospital, N. Y. summarized the situation with respect to the changed method of treating cardiac disease by giving interesting case histories of two physicians – one, John Hunter in 1785; the other, Sir James Mackenzie in 1907-08. Autopsy on John Hunter showed "extensive disease of the coronary arteries, calcification of the aortic valves and two large scars representing old myocardial infarcts." For eight (8) years this physician carried on an extensive medical practice. When an autopsy was preformed on Sir James Mackenzie after seventeen (17) years of active medical practice, "extensive myocardial disease was found."

At the conclusion of this panel and the question and answer period that followed, the continuance of a useful and happy life for the cardiac should forecast hope, rather than despair, for patient and therapist.

As one listened to *Viewpoints* on *The Economics of Rehabilitation* by speakers from the fields of Orthopedics, Insurance, Industry, Labor and the Management of State and Government Hospitals, he felt an assurance that an accepted contribution to the American Way of Life is being made though the efforts of those interested in reducing the tremendous cost of disabilty thru rehabilitation. It was most encouraging and stimulating. Facts like the following are hard to refute. "In 1952, 64,000 rehabilitated workers earned $115,000,000.00 or an average of $1,800.00 each. As taxpayers in that year they paid the Government about $10,500,000.00. It costs more to support a disabled individual for one year than to rehabilitate him and make him independent (perhaps) for life. When we compare the cost of welfare – $165.00 a month per family or $1,980.00 a year, wih the yearly cost of $800.00 for the rehabilitation of an indvidual, we have convincing evidence of the economic importance of rehabilitation.

Thursday, like Wednesday, was a full day. The afternoon panel on *The Progress of Physical Medicine* presented much evidence that substantial progress is being made. The symposium, *Research in Corrective Therapy*, presented not only the "How" and "Why" of research, but also what corrective therapists are doing in the field, (These papers will appear in the Journal so will not be reported at this time.) It would be difficult to select the most important facts presented by the speakers in this symposium. True to the topic, *Research in Corrective Therapy: A Challenge and a Responsibility*, each speaker contributed something of importance. *Research Methods and the Problems in the Application of Corrective Therapy* for both *Neuropsychiatric and the General Medical and Surgical Patients* was discussed. *The Essential Areas for Research in Corrective Therapy* were delineated and two papers by corrective therapists reported studies on the *Home Treatment Progam* of *Multiple Sclerosis* and the *Cross Transfer Effect of Strength and Endurance* which augurs well for our continued successes in the field of research in corrective therapy.

The Banquet is always the uplifting meeting of our conference – the event fraught with inspiration and guidance. We were not disappointed. Dr. Karl Menninger received the John Eisele Davis Award. Louis F. Mantovano, our hard working President of the past year, was recipient of the Annual Corrective Therapy Award. The Achievement Award in Rehabilitation went to Russell Williams, Ph.D. and Honorary Membership was given to Allan Gregg, M.D. Ten chapters were presented with their Charters, having met the rigid requirements set up by the Committee on Chapter Activities.

At the Banquet, the speaker, Harold Russell, needed no introduction to our group. His dynamic presentation of facts and figures showing the world-wide need for rehabilitation, not only of those disabled by war, but also those disabled on the highways, in industry, in the home, in every phase of life including the disabling diseases of lifetime living, left us with a challenge to be "up and at it" in our own community and nation, and thru the United Nations on an ever expanding world wide basis.

The innovation of the Friday morning program of "short papers" by corrective therapists was a fitting climax to one of the best organized, best attended of our conventions.

A review of the topics is indicative of the broad concept of the expanding Corrective Therapy Program. To select the best from the twelve (12) presentations would not only be difficult, but also deprive the reader of the details of an excellent series of papers sure to be published later.

This session was a fitting climax to the Ninth Annual Conference of our Association and has set a pattern for future meetings. In summary–The Boston Conference of 1955 will rank with many of the history making events that have emanated from Historical Boston in the past.

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KINETIC ANALYSIS OF THE SPASTIC GAIT AND ITS THERAPEUTIC IMPLICATIONS*

ARTHUR M. STEINDLER, M.D.**

Introduction

What makes the analysis of the spastic gait so difficult is the fact that in most cases the lesion is not localized as it is in the paralytic gait. It is a compound phenomenon. The spastic gait is a contracture gait and the contracture is seldom confined to one joint only. It appears in the well-known triad; the equinovarus, the flexed knee, and the hip joint in flexion, abduction and inward rotation. All the contractures are closely interrelated and, what is more, they extend their effect over the body as a whole. The impediment these contractions offer to the gait calls for certain auxiliary movements of the body and the upper extremity.

Another point is that the contractures are not stable in the sense of usual contractural deformities, but they are under the continuous influence of innervational fluctuations. The basic reason of this changing innervational flow is the failure of the usual inhibitory centers in the cord and brain which normally control reflex reaction.

Uni and biarticular muscles.

MUSCLE DYNAMICS

Our immediate object is to analyze the basic difference in the behavior of the muscles involved in the spastic gait compared with their normal functions.

From the muscle mechanical angle the muscles of the lower extremity can be divided into those which control one joint only – the monoarticular muscles, and those which control two or more joints or the biarticular or pluriarticular muscles. Each of these groups play its particular role in the mechanism of the spastic gait.

THE BIARTICULAR MUSCLES

The biarticular muscles can again be divided into those which are arranged either in front or in back, such as the rectus femoris and the hamstrings, and those which cross from front to back, such as the tensor and the sartorius. Let us first consider the non-crossing muscles. These are the muscles which are mutually at play in the process of lengthening and shortening of the limb both during the standing and swinging period.

Under normal conditions, this lengthening and shortening mechanism occurs under what is called a concurrent shift between the biarticular rectus femoris and the hamstrings. This concurrent shift is isometric, i.e. there is no shortening of the muscle. It implies that its action is neutralized at one end by its antagonist; usually at the one end with the lesser gravitational movement to resist; the other end produces the visible motion. For instance, when the leg is shortened by flexing knee and hip, the upper end of the hamstrings moves upward being prevented from extending the hip by the preponderance of the hip flexors. At the same time, the lower end of the hamstrings is free to flex the knee and so to follow the muscle in its upward move. The rectus femoris, together with the other hip flexors, flexes the hip so that its upper end moves downward; at the lower end again it is prevented from extending the knee by preponderance of the contracting hamstrings so that the whole muscle shifts in downward direction. Therefore, we can say that the muscles glide parallel to each other—the one upward and the other downward. Therefore they do not lose anything of their natural strength. We call this a "concurrent movement." The upward movement of the rectus is associated with a downward shift of the hamstrings when the leg is lengthened; the upward shift of the hamstrings with a downward shift of the rectus when the limb is shortened.

In the swing of the leg backward and forward, the mechanism is different. As the leg is swung forward, the hip is flexed and the knee is extended; consequently, the rectus femoris contracts at both ends and becomes shortened. At the same time, the hamstrings become passively distended at both ends.

Conversely when the limb swings backward, the hamstrings extend the hip joint and flex the knee contracting at both ends while the opposing rectus femoris is being distended both at the upper and lower end. This movement is called a "countercurrent movement" because one of the muscles goes into bipolar contraction, whereas, its opponent goes into bipolar distension. While the concurrent movement is an isometric one because the length of the muscles is maintained, the countercurrent movement is an istotonic one; that is the muscle is allowed to con-

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tract and shorten. This is the normal mechanism of shortening and lengthening and of backward and forward swing during the gait.

Now what happens with these biarticular muscles in the spastic? If he maintains hip and knee rigidly in flexed position, it indicates a persistence of the biarticular muscles in a concurrent movement which shortens the leg.

If, on the other hand, the limb is flexed in extended position as seen in the hemiplegic, the movement of these opposing muscle groups is also concurrent, as explained above. The difficulty is not in the concurrent movement as such but rather in the change from shortening to lengthening and vice-versa. The limb is frozen, so to speak, in position of either lengthening or shortening, as the case may be, and the biarticular muscle remains in position having lost its ability of alternation.

Now what happens to the biarticular muscles of the spastic in the countercurrent movement where the acting muscle shortens at both ends and the opposing muscle is distended at both ends? Due to the abnormally high reflex irritability of the spastic muscle, the antagonist responds to bipolar distension with the stretch reflex contraction and thereby interferes with the forward or backward swing of the limb. And, as the muscle contracts to its resting length, instead of relaxing so as to give free play to their opponents, the isometric situation again arises with the installation of a concurrent shift. Hence we see that the position which the biarticular muscles prefer to persist in is shortening of the limb by flexion of hip and knee.

This also applies to the lengthening mechanism where the prevailing contracture of the rectus at the knee, and that of the hamstrings at the hip result in extending the limb. That the shortening flexion position prevails is due in the first place to the powerful uniarticular flexors and secondly, to the crossed biarticulars, namely the tensor fascia and the sartorius. The latter muscles, running from the anterior to the posterior side of the leg, are exclusive shorteners of the limb when they contract. They have no real antagonist as there is no biarticular muscle running from dorsal to ventral.

As far as the non-crossing biarticular muscles are concerned, it is their countercurrent rather than concurrent action which is disturbed. One notes in particular in the spastic gait that when the hip is flexed and the body bends forward, the flexion of the knee by the upward moving hamstrings always increases. It appears, therefore, that the difficulty lies not so much in lengthening and shortening mechanism itself which involves concurrent movement of the biarticular muscles; the limb is fixed or frozen innervationally in shortened or lengthened position with the biarticular muscles held in their isometric stage. The trouble rather lies in the countercurrent movement of the biarticulars, those displayed in the for- and backward swing, where the acting muscle is in bipolar shortening and its antagonist in bipolar distension.

Only the crossed biarticular muscles, namely, the tensor and the sartorius, when innervated are in the state of bipolar contraction, therefore, isotonic and not isometric when the hip limb is shortened, or in a state of bipolar distension when the limb is extended.

The uniarticular muscles

It is the uniarticular muscles of the spastic which tip the scale and which force characteristic positions of the joint. This applies especially to the hip joint where the iliopsoas muscle prevails over the extensors. That the uniarticular muscles have the power of overcoming their biarticular opponents is well known, f.i. the terminal range of flexion of the knee when the hip is extended is carried out by the short head of the biceps; the terminal extension of the knee when the hip is flexed is produced by the vasti.

In the usual flexory fixation of the limb, the rectus is fixed in isometric state moving downward. The hamstrings are fixed also in isometric stage, moving upward. The question now arises, what causes this tie-up or the freezing of these muscles, as it were, in this position? Two explanations seem possible. One is purely mechanical, the other innervational. Either the uniarticular muscles, together with the crossed biarticular, tip the scales in favor of flexion contractures; or else the biarticular muscle has ceased to act as biarticular muscle but has become uniarticular by reason of a segregated innervational mechanism. This mechanism would act in such a fashion that the upper and lower halves of the muscles are innervated separately at one time.

Let us first consider the more plausible eventuality; namely, that the preponderence of the uniarticular and of the crossed biarticular muscle is responsible for the flexory attitude of the limb. We find clinically that in the spastic the normal muscle pattern of the biarticular muscle action, especially in its countercurrent action, is completely overthrown, mainly by the preponderence of the flexory or, more rarely, the extensory action of the uniarticular muscles. The action current picture reflects this overthrow: the iliopsoas becomes active in the standing phase when normally its maximum is in the swinging, and its minimum in the standing, phase.

The biceps femoris also becomes active in the

standing phase when it should have its maximum in the swinging phase and only at the beginning and end of the standing phase, according to Scherb.

Now let us consider the second possibility, namely, that of double innervation of the biarticular muscles. This view has been brought out recently by Markee, Logue, Williams, Renn, Walker, and Durham.[1] These authors oppose the commonly accepted idea that a biarticular muscle is made to exert a rotatory effect upon one articulation by having its effect upon the other joint neutralized by antagonistic action. They assert that this theory of antagonistic fixation of one end of the biarticular muscle is thoroughly shaken by their newest investigation into the innervation of biarticular, both the non-crossed, as the rectus and the hamstrings, and crossed muscles, as the sartorius and the tensor.

They found that the semitendinosus has two nerves—an upper at the ischiotuberosity level and a lower at the level of the middle third of the thigh.

The semimembranosus has also two nerves, one in common with the distal portion of the tendinosus, and a lower entering successively the anterior of the muscle.

The biceps femoris is also a double innervated muscle from the tibial division of the sciatic nerve, an upper branch and a lower branch.

The rectus femoris has two nerves—one at the lateral border between the rectus and vastus lateralis and one at the medial border of the muscles.

The sartorius has a single supply, but this is divided into five separate branches.

The authors further believe that they have demonstrated by electrical stimulation of the branches to individual areas that they can produce isolated contractions. By cortical stimulation they show that the portion of the hamstring muscles proximal to the tendinous inscription contracts during extension of the hip while the portion distal to it contracts during flexion of the knee. Both portions, however, contract when there is simultaneous extension of the hip and flexion of the knee which would mean that, in this case, the muscle contracts bipolar or isotonic. The two parts of the muscle, therefore, function as though they were reciprocally innervated; the proximal part acts as a powerful extensor of the hip irrespective of whether the knees are flexed or extended. The distal part is a powerful flexor of the knee also irrespective of whether the hip is flexed or extended. Therefore, they state that movement in one joint only can be produced by all thigh muscles offering any resistance to antagonistic movement in the other joint. This partial contraction of the muscle with double innervation is facilitated by the fascial attachment of these muscles which play an important role in transmitting the force; this applies especially to the semitendinosus, the rectus and the sartorius.

What this theory postulates is that there exists a reciprocal innervation in different portions of a single muscle, which portions can be made to function independently. This is not too surprising if we consider the segregated function of other muscles, f.i. the trapezius which really acts as four different muscles.

Ground pressure

It appears that the complete overthrow of muscular equilibrium in the spastic also has its expression in the fluctuations of ground pressure. Markee and his co-workers determined this pressure by means of a force plate which measured the pressure in all three planes.

1. *The Vertical Pressure*

The typical pattern of the normal gait is characterized by two peaks of vertical load corresponding to the beginning and to the end of the swing of the opposite leg. In the normal pattern, the vertical load increases rapidly as contact is made with the ground to reach a peak load greater than the weight of the subject which means an acceleration greater than "g". The vertical load drops to a minimum as the area of contact moves forward from the heel and the foot is solidly placed. Then as the swinging leg passes the center of gravity, the vertical load again increases and reaches its maximum at the beginning of the phase of double support. This means two peaks for the single step.

In contrast, in the hemiplegic, the vertical pressure curve is more variable. The vertical load is built up more step-like. While the normal individual strikes the ground with the knee in full extension and absorbs the resulting shock by slight knee flexion which correlates with the negative knee movement, the hemiplegic also strikes the ground with the knee in extension but there is little subsequent knee flexion. The curve records rather the shock acceleration as a third peak.

Curiously enough, we see the same characteristics in the normal leg of the hemiplegic.

2. *The knee movement* is also characteristic.

In the normal, the knee movement is S-shaped with an initial negative component followed by a positive one. The negative component corresponds to the early stance phase. When the body centers ride over the foot, in the stance phase, the knee moment

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[1] J. E. MARKEE, J. T. LOGUE, M. WILLIAMS, R. N. RENN, L. B. WALKER AND S. C. DURHAM, *Journal of Bone and Joint Surgery*, 37-A1:125, Jan. 1955.

becomes strongly positive to the degree of 300 to 500 inch pounds.

In the hemiplegic, on the other hand, the knee movement is strongly positive during the entire stance phase and in the nonparalytic leg a similarily condition obtains which indicates a bilateral pattern. And it was found that neither the wearing of a short brace nor any restraining device changes this pattern.

From these findings, it seems more logical that the training should stress the reciprocal bilateral nature of the gait with non-paralytic extremities receiving more attention—a point which we will come back to later on.

Specific Therapeutic Implications.

There are four principal therapeutic postulates for the spastic.

1. Alignment
2. Stability of the joints
3. Mobility or dynamic control
4. Motivation, alternation and automatism

The first two are purely static requirements.

Alignment means the release of contractures.

Restoration of the stability of the joint largely means arthrodesing operations, particularly of the foot.

The fourth postulate is the development of an independent alternation of the movement of the limb and the development of automatism versus calculated and voluntary motion. It is entirely an educational problem.

MUSCULAR DYSEQUILIBRIUM

The special point in this kinetic analysis is the restoration of the muscular equilibrium which concerns the third postulate, namely, active muscle control. In the frontal plane the ab- and adductory equilibrium is destroyed, partially due to the relative weakness of the abductors, and partially, to the innervational overload of the adductors. The result is that the lateral balance has become difficult.

Because of the preponderance of the adductors, the patient is unable to separate the limbs and secure a good standing base. Furthermore, the adductors act as an inward rotator when hip and knee are flexed. The limb pivots over the ball of the foot and this again destroys the balance in the horizontal plane and makes the forward pointing of the feet more difficult Therefore, the restoration of the lateral equilibrium, either by tenotomy of the adductors, or by resection of the obturator nerve becomes necessary whenever conservative means fail.

In the sagittal plane hip and knee are in flexion contracture or, in some hemiplegic cases, in extension. At any rate, the non-crossing biarticular muscles are tied up in isometric state and the automatic change from shortening to lengthening of the leg and vice-versa is greatly handicapped. Even more so is the for- and backward swing because of intolerance to overstretching on the part of the antagonist, as explained above.

DYNAMIC EFFECTS

This inability to lengthen and shorten the limb has two important mechanical effects; one, static; one, dynamic.

Mechanically the stability of the body is lowered and the trunk is bent forward to bring the center of gravity in front of the flexed knee joint.

Dynamically, the inability to put the legs obliquely forward or backward during the standing phase greatly interferes both with restraint and propulsion. The result is that the steps are unduly short. The body in order to keep balance, not only has to sway sideward in the frontal plane but also for- and backward to maintain balance in the sagittal direction.

SPECIFIC THERAPEUTIC IMPLICATIONS IN RECONSTRUCTION

It seems to us that the root of the trouble lies in the inability of the biarticular to carry out their normal concurrent shift which produces lengthening and shortening. Furthermore, the reflex irritability of these muscles interferes with the for- and backward swing during which hamstrings and rectus alternatingly come under bipolar stretching.

The specific therapeutic implications which arise from this analysis seem obvious. Since the normal pattern is so complicated and it is so deeply deranged by the failure of the biarticular muscles to act properly, the conclusion should be that the pattern should be simplified by eliminating the biarticular action of these muscles; in other words, changing the biarticular muscles into unarticular which not only eliminates the problem of concurrent or countercurrent movement but also gives the joints an increase in rotatory moments adequate to control the exaggravated motor impulses of the antagonist. This pertains, particularly, to the restoration of muscular equilibrium in the sagittal plane: to the ability to carry out for- and backward swing and shortening and lengthenning of the extremity.

The operative procedures applied to transform biarticular muscles into uniarticular ones consists in separating the muscle from its origin or insertion either by detachment or by severance of the muscle from its fascial expansion.

1. The release of the rectus femoris as a flexor of the hip in spastic paralysis.

The rectus is released at its upper end and is inserted to the greater trochanter according to Durham.[2]

Postoperatively, one observes a striking postural change has taken place by reduction of the lumbar lordosis. The tension on the hamstrings is released and the tuberosity of the os ischii is rotated downward. The transposition of the origin of the rectus femoris increases its extensory effect upon the knee and the flexion contracture of the joint is corrected.

Durham[3] reports 21 cases. There was an increase in the extensory ability of the knee joint in 13, and a reduction of the hip flexion in 9 cases. No doubt the better extensory ability of the rectus is due to the fact that it was transformed into monoarticular muscle.

2. The release of the flexion contracture of the extensory retinaculum

The quadriceps' gliding is facilitated at the patellar level both by fascial and muscular structures. The fibers of the fascia lata extend to the border of the patella and become continuous with the deep fascia and the intermuscular septa attached to fibula and tibia.[4] In the cerebral spastic, the prolonged knee flexion causes the stretching of the patellar ligament but the medial and lateral structures of the expansion are contracted and the extensory action is restricted by the fibrous and muscular retinacula which are attached to the side of the patella.

The final extensory pull is not exerted upon the tuberosity of the tibia but rather upon the medial and lateral expansions. To release the flexion contracture, it is necessary to divide these structures.

The iliotibial band is divided similarly as it is done in Yount's procedure[5]. According to Egger's report of 1950,[6] the results are excellent.

3. A third procedure is the hamstring tronsposition, as advocated by Eggers.[7]

This operation simply consists in the release of the hamstrings from their attachment at the tibia and fibula and their implantation into the condyles of the femur. This makes the hamstrings a uniarticular muscle and it greatly increases its extensory effect upon the hip joint.

4. A fourth procedure is the recession operation of the gastrocnemius of Strayer.[8]

The severance of the gastrocnemius from the soleus allows the patient to place his heel on the floor when walking.

We recall that Silfverskiold in 1923[9] approached the problem by separating the heads of the gastrocnemius from their origin at the lower end of the femur. By entering the deep fascial compartment of the gastrocnemius by blunt dissection, the muscle is separated from the soleus beneath the point where the tendon of the gastrocnemius enters the common tendon with the soleus. When the gastrocnemius tendon is severed over a probe and the foot is dorsiflexed, a gap appears of about ¾ inches.

This operation also reduces the biarticular action of the gastrocnemius so that a forcible dorsiflexion of the foot does not involve a flexion of the knee at the same time.

Here are four operative methods all based on the proposition of simplifying the gait pattern by making uniarticular out of the biarticular muscles and, thereby, restoring the overthrown balance between flexors and extensors.

The quadriceps' gliding is facilitated at the establish active muscle equilibrium on the basis of a simplification of the gait pattern based on the conversion of biarticular into uniarticular muscles and thereby providing a greater rotatory moment for the remaining joint. They by no means exhaust the opertive armamentarium in the spastics. Tenotomies, selective nerve resections and especially arthrodesing operations still have their place.

Re-education and Rehabilitation of the Spastic

All operative procedures can be considered as mere episodes against the background of a wide and continuous re-educational program. In a series of 300 spastic cases from our clinic, only 22 per cent were subjected to operations of any kind, either for alignment or stabilization or active muscle balance.

It stands to reason, however, that simple and single purposed operative procedures such as those mentioned above, which simplify the gait pattern of the spastic naturally will make re-education easier. The most important elements in re-education and rehabilitation of the spastic gait are the development of alternation and of automatism.

Restoration of realignment, stability, and muscle equilibrium, whether it be by conservative or operative means, relieves the spastic of only part of the great strain of mentally concentrating on the mechanism of the gait by a laborious and fatiguing voluntary muscle effort.

The two principal objectives of re-education are to suppress concomitant motion in the other limb, i.e. achieve alternation, and make the effort of the

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[2]S. C. DURHAM, *Journal of Bone and Joint Surgery*, Vol. XX:339, 1940.
[3]*Ibid.*
[4]G. W. N. EGGERS, "Surgical Division Patellar Retinacula", *Journal of Bone and Joint Surgery*, 32-A:80, Jan. 1950.
[5]G. W. N. EGGERS, "Transplantation of Hamstrings in Cerebral Palsy," *Journal of Bone and Joint Surgery*, 34-A: 671, 1950.
[6]*Ibid.*
[7]*Ibid.*
[8]L. M. STRAYER, "Resection of Gastrocnemius," *Journal of Bone and Joint Surgery*, 32-A:671, 1950.
[9]NILS SILFVERSKIOLD, "Reduction of Uncrossed Two Joint Muscles to One-Joint Muscles in Spastic Cases," *Acta Chir. Scandinavia*, 56:3;315, Oct. 23, 1923.

THE VALUE OF THERAPEUTIC EXERCISE WITH SPECIAL REFERENCE TO ARTHROTOMIES OF THE KNEE*

OSCAR H. CINER, ED.D.

The signs and symptoms of internal derangement of the knee consisting of pain, tenderness, swelling, locking, restriction of range of motion and instability, when persistent despite conservative treatment,, are indications for surgical intervention. Pain, swelling, instability and restriction of motion often continue despite the most careful surgery and the usual post-operative care.[1]

Nowhere in the human body is the functional integrity of a joint so dependent upon muscle support as is the knee. The stability of a joint depends upon three factors:

a. The manner in which the bones are fitted together within the joint.

h. The ligaments which hold the articulating bones together.

c. The muscles which move the joint or hold it in desired positions.

The rationale for the use of progressive resistive exercise in knee arthrotomies runs as follows: The manner in which bones articulate is a major factor in stability as joints. Contact or interlocking are minimal in the knee, throwing a greater load upon the soft tissues. The knee is, therefore, richly endowed with ligaments. When these ligaments are stretched or torn, the muscles take the stress as the last line of defense. If the supporting muscles are also weakened, the resulting instability of the knee permits further trauma to occur. Such trauma produces pain and swelling which set up a vicious cycle to perpetuate the signs and symptoms. It was the pain which caused much of the ligament laxity and muscle weakness in the first place. The most direct way to break into this cycle is by quadriceps development to a degree sufficient to protect the joint from the normal strains of weight-bearing.[2]

Orthopedists are cognizant of the importance of muscular support of all joints, and for a number of years have been encouraging exercises in order to prevent atrophy, to keep joints mobile, and to maintain physical strength.[3] The relationship between quadriceps atrophy and poor knee function has been too obvious to be missed.[4] Yet quadriceps setting, walking, bicycling and stairclimbing which may be said to have been standard exercise procedures for the knee, have resulted in slow improvement in most cases.[5]

Bearing these factors in mind, the following concepts have been developed, and form the basis for the therapeutic exercise program for the knee at the Bronx Veterans Administration Hospital:

a. Pre-operatively, quadriceps setting is performed and, if possible, progressive resistive exercise is administered to the quadriceps, always making sure that the load will permit full extension.

b. Immediately following the operation, quadriceps setting and straight-leg raising are attempted, whether these are possible of achievement or not.[6] Quadriceps setting and straight-leg raising are also done in the unaffected leg for the "cross-education" effect.[7]

c. When the leg can be raised, resistance to this movement is gradually increased. The amount will depend on the gradual increase in strength of the muscles from day to day.

d. When the plaster cylinder, which is used for early immobilization of the knee, is removed, active assistance and active exercise are started through as full a range as possible always making sure that full extension is attempted.

e. After sutures are removed, progressively increasing resistance is administered, with the load never too heavy to prevent full extension.[8] The increase in resistance depends on the increase in strength of the

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[6] BANCROFT, F. W. and MARBLE, H. C.: *Surgical Treatment of the Motor-Skeletal System*, Lippincott Co., Part II, 2nd Ed., London, 1951, p. 1100

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quadriceps from day to day. The load is never heavy enough to produce more than mild pain.

f. No weight-bearing is allowed until there has been adequate recovery of quadriceps strength.[9] When strength of the affected quadriceps approximates two-thirds that of the unaffected leg, progressive weight bearing is started.

g. After ambulation is begun, progressive heavy resistance exercises are continued until the quadriceps have equal strength.[10]

One hundred and two patients who have had their knees arthrotomized at the Bronx Veterans Administration Hospital for a variety of internal derangements of the joint comprise this study project. These cases were not selected, but were accepted as patients when admitted to the hospital with a diagnosis of internal derangement of the knee joint. They were divided into two fairly equal groups. Group I consisted of fifty-two patients who were supervised in active and resistive exercises to both lower extremities pre- and post-operatively. The regimen for Group I was administered by the Physical Medicine Rehabilitation Service as an adjunct to Orthopedic Service. The other fifty patients, designed as Group II, were advised to do suggested exercises post-operatively for the affected leg, but were not supervised therein. These suggested exercises included the usual and standard ones; such as quadriceps setting, active leg exercises and early ambulation.[11] The patients in Group II had received their knee arthrotomies prior to the development of the therapeutic exercise program utilized for Group I. These fifty patients form the control group.

The patients in Group I were closely observed, tested, measured and interrogated to determine the results of the exercise treatment. These patients were tested and measured for strength, endurance, range of motion, and knee size for both legs; and questioned concerning the symptoms of pain, swelling and weakness for the affected leg. The unaffected leg was also tested, so that a comparison could be drawn between the legs and the extent of impairment guaged.

The patients in Group II were tested and measured for the same items and symptoms, but only during the follow-up examination, since they had not come under supervision before. In these cases, the testing of the unaffected leg had additional significance. Ordinarily, it would be difficult to properly evaluate results without knowing the precise ability of the patient pre-operatively and during the course of hospitalization. But in this instance, the degree to which the affected leg was analogous to the unaffected in respect to strength, endurance, range of motion, etc., served as an aid to evaluation.

The follow-up testing and examination of both groups of patients in this project usually took place between one and two years after surgery. The judgment as to the degree of improvement was based upon the orthopedic physician's evaluation, which had been made after he had examined the patient clinically and had studied the results of the tests and measurements. His evaluation was based upon any residual signs and symptoms, and upon the patient's ability to function at home and at his job. The patient was placed within one of four categories.

1. No change or worse.
2. Slight or temporary improvement.
3. Marked improvement.
4. Complete restoration to normal.

The patients who were evaluated as "marked improvement" or "complete restoration to normal" (class 3 or 4), may be considered to be those who are able to function adequately at home or on the job, and are to be considered as having had "good results." Those with "no change" or "slight improvement" (class 1 or 2) may be considered usually not to be able to function adequately except at sedentary occupations, and are to be considered as having had "poor results."

The results as evaluated by the orthopedic physician show Group I to have had 96 per cent good results and 4 per cent poor results. Group II, on the other hand, shows 54 per cent to have had good results and 46 per cent poor results.

Certain observations which were made during this research project might be further evaluated. These are:

a. Muscles should be gradually "warmed up" before optimal load is used.[12]

b. Periods of therapeutic resistive exercise can be repeated more than once a day.

c. Quadriceps weakness goes hand in hand with persistence of the signs and symptoms of pain, swelling and instability.

d. Knees that are unstable either from loss of ligamentous support or muscle atrophy should refrain from full weight bearing activities until quadriceps power has been restored by non-weight bearing exercises.

Continued on Page 131

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THE UTILIZATION OF THERAPEUTIC POOLS IN THE TREATMENT OF ORTHOPEDIC DISABILITIES*

HENRY ROCKSTROH, MAJOR, M.S.C.**

Therapeutic pools provide a most desirable medium for the treatment of a variety of orthopedic disabilities, especially those which confine the patient to bed, chair, or braces.

It is the particular intent of this paper to present the more important aspects of pool therapy in the treatment of orthopedic disabilities to include psychological values; selected standards, modified and improvised equipment; major type of cases treated and the manner of treatment.

Although hydrotherapy is one of the oldest remedial agents, it was, until fairly recent times, available only to those who were wealthy and able to travel great distances to institutions located near natural springs. At the present time the excellent benefits of most forms of hydrotherapy are provided in practically all hospitals, large and small. This form of therapy has advanced to the stage where it is now prescribed by dosage in type, time, and temperature with anticipated physiological results to cope with individual patient requirements just as any other therapy is prescribed. The use of therapeutic pools is an extremely valuable asset in the program of physical reconditioning or corrective therapy, serving not only as a subsidary to the therapeutic armamentarium but also playing a prominent role in the promotion of the patient's psychological outlook toward recovery.

You may logically ask the question, "How extensively are pools used on a therapeutic basis?" A study by the writer completed in 1953 revealed that six percent of the patients in the institutions which participated in the survey were actually treated in therapeutic pools. It may also be interesting to this particular audience to note that at the time of the survey approximately twenty-eight percent of the total patients in the hospitals polled were referred to the Physical Medicine and Rehabilitation Service. Most of these hospitals were V.A. institutions. Let us now consider some of the more important aspects of treating orthopedic patients by pool therapy. Singularly or in combination, the psychological and/or physiological values of pool therapy lend materially to rapid recovery of complicated and uncomplicated cases. Many of these values are well known and no attempt will be made to discuss them in detail; however, the writer feels that certain of the psychological aspects are worth reemphasizing.

The psychological influences which are unquestionably important factors in the process of producing the many desired results through the use of the therapeutic pool are varied and to a large extent dependent upon the emotional makeup of the patient; however, the values that follow may be generally applied. For the most part, aquatic activities are enjoyable and have a wholesome recreational effect. Mere freedom from the bed itself improves the patient's outlook and produces a more receptive attitude for treatment which may follow. The degree of incompetency is greatly reduced and not nearly as noticeable to others when the body is immersed. The ability to move freely and voluntarily, regardless of how slight, arouses interest and stimulates effort. The new environment provides a healthful diversion, thereby relieving boredom, frustration, and discouragement during convalescence. The mental concentration required in learning new skills also helps to relieve mental tension and aids in restoration of self-confidence by mastery of these skills. Realization of movement in water when it could not be accomplished otherwise and the increase of action without pain, when such movement normally produces pain, are important factors in reducing inhibitory spasm through decrease in pain and fear. A final psychological value is that improvement is quite obvious and readily appreciated by the patient.

In connection with psychological values the author is often reminded of a group of orthopedic patients at the U. S. Army's Oliver General Hospital which, by the way, was located in Augusta, Georgia, scene of next year's annual conference. This particular group consisted of bed patients who were receiving treatment in the therapeutic pool, which necessitated transportation via litter and ambulance to the treatment area. The physical benefits from the pool therapy, of course, were numerous and readily observed but the psychological factor was even more apparent when, if for some reason the patients' treatment was delayed or cancelled. The patients concerned were never satisfied until the ward nurse called to determine the delay or cancellation. The Physical

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Reconditioning Section, and the pool therapists in particular, had no peace for several days following such an incident because the patients were determined that there would be no excuse for failing to get them out of their beds and into the water. Because of the popularity of this activity it was necessary to run a full 7-day week treatment program. With such a display of interest on the part of the patients the therapists did not mind the extra duty, and in fact, seemed to enjoy assisting those individuals who depended on them to such an extent.

What may seem like trivial and unimportant matters, but which are of extreme importance in the opinion of the author, are the initial interview of the patient and the skills to be taught.

The initial interview of the new patient by the therapist is regarded as highly important to the success of the program because at this time the patient is oriented as to what should be accomplished and in what manner. Every patient, when applicable, whether or not he could swim prior to hospitalization, should either demonstrate competency or be taught to do the following skills on which his safety in the water will depend:

1. How to get into and out of water in ways best suited to his condition.
2. How to maintain balance in shallow water.
3. Controlled breathing.
4. How to take a prone floating position and recover to upright position.
5. How to float on back or rest in floating position.
6. How to recover from a back float to upright position.
7. How to scull with one or both hands.

Specific exercises as prescribed for the patient's disability may be demonstrated at this time or during subsequent treatment periods with particular emphasis on contraindicated movements or activities. Treatment should always commence with the physiological tolerance of the individual and become progressively more strenous as tolerance increases.

When applicable, actual swimming skills are prescribed as the treatment progresses. If properly controlled, this method of therapy is highly successful as it relieves inhibitions associated with the patient's injury by preoccupation as he strives to learn the skill while performing the exact desired movement. Abduction of the arm for example is readily attained while performing the arm portion of the elementary back stroke.

Aside from the knowledge and enthusiasm of the therapist himself, probably the most important aspect in the treatment of orthopedic patients is the selection of equipment to be utilized. A therapist without proper and adequate equipment is much like the well-known carpenter without his hammer. Many programs suffer; indeed many would-be programs are non-existent merely because of the lack of sufficient treatment facilities. This should almost never be the case as long as there is a water supply and patients are available. The necessary basic equipment to initiate a therapeutic aquatic program can be found in practically any hospital that has a pool.

What do we need in the way of equipment to get started? In many cases, just water. It is amazing what can be accomplished with the therapist manually supporting the patient during the treatment period with relatively little effort. Economy of personnel or plain common sense would soon dictate that a plinth of wood or metal should be obtained. A metal plinth or examining table is usually available and will serve temporarily until a satisfactory rust-resistant table is procured. Steps, inclined ramps, and inner tubes have often served as supporting surfaces to accomplish the desired treatment. And what's to prevent the stringing of two ropes across the pool to serve as parallel bars until permanent ones are available? The start is the thing; so applying one of Newton's laws we might say that a therapeutic pool program in motion will tend to remain in motion and will also gain in momentum as the therapist applies himself. As any program progresses it is only reasonable to assume that more equipment will be added, all of which should be designed for the comfort of the patient and to facilitate his handling and treatment. A well-equipped pool should contain most of the following items depending of course, on the needs of the patients concerned. In describing and showing slides of various types of equipment it would be difficult to mention all of the types of orthopedic patients that may utilize the equipment. Practically all orthopedic patients may be advantageously treated by pool therapy sometime during their rehabilitation phase, however. Common types of equipment are:

PLINTH—may be plain wood or metal and may or may not be adjustable. Lowman has devised an excellent plinth.

WALKING BARS—chrome-plated bars mounted on supports are easily constructed as are varnished wood poles which may be floated in and out of position. These may or may not extend width of pool. One institution has the bars on rollers over the edge of the pool so as to adjust them to the desired depth.

LITTER—non-collapsible to serve as stretcher for transporting light patients from portable cart to water. Requires two attendants. One U. S. Army hospital

placed wheels on the litter and also attachable buoys for floating purposes to keep patient on litter while in water.

FLOATS—air matress, inflated trunks, rings, or tubes and cork or wooden floats may all be advantageously used in the treatment program. Special floats may be designed to support head, neck, arms, pelvic region, thigh, leg, and ankle.

WEIGHTED CHAIR OR BENCH—wooden or chrome-plated brass tubing chair with or without arms offers assistance to both patient and therapists depending on how it is utilized. Slide shows both uses. Also note the rubber waders used by the therapist. Often times a bathing suit would suffice.

LIFTS—electric, hydraulic, or even manual lifts would be a luxury in a therapeutic pool situation.

SWIMFINS AND MITTS—a most effective way to increase resistance. In one hospital, swim mitts were constructed of aluminum with finger straps to hold hand open as in the case of a patient who does not have finger extensors.

EAR PLUGS AND NOSE CLIPS—quite often certain patients are more comfortable with ear plugs and nose clips and they should be available.

MIRROR—mirrors are easily obtained and have many uses in a therapeutic pool situation not the least of which might be merely to provide an opportunity for the patient to see himself in a different medium. They assist a great deal in maintaining correct form and in posture. Tom Meyer of VA Hospital, Fort Lyon, Colorado, makes excellent use of postural mirrors.

Important modified and/or improvised equipment which has proved useful to many therapists in the field includes some of the following:

OVERFLOW GUTTER—constructed on basis of baby car seat.

CHAIR OR BENCH—particularly useful for treating lower extremities of young patients. An excellent chair of this nature was in use at Newington Home for Crippled Children.

PLUNGER WITH PADDED HANDLE—a plunger, as shown sometimes offers the necessary support. One may be used in the corner of a pool or near the side. Two may be used in the center of the pool. Used successfully at Oliver General Hospital.

SPLINTS—wooden, metal, and plastic splints of varying sizes and shapes for different parts of the body. A few are depicted. Stan Wertz at Kennedy VAH in Memphis uses short knee braces to assist certain patients in walking in shallow water—of particular value to patients with weak quadriceps.

UNDER WATER PULLEYS—used in the same manner as regular wall pulleys have been proposed by Earl Mason of Nichols VAH in Louisville, Kentucky.

MUSIC—adds to enjoyment of pool therapy. Swim to music. Leo Berner has music piped into the pool at Bronx VAH in New York.

SWIM MASK—stimulates underwater work to increase lung capacity.

VIEW BOX—to observe patients—used at VAH, Long Beach, by George Devins.

RUBBER BRICK—to stimulate general conditioning and teaching water orientation for non-swimmer. Proposed by George Devins.

SHOULDER WHEELS—underwater shoulder wheels may be operated by those unable to turn the wall shoulder wheel.

HORIZONTAL LADDERS—suspended over pool so that they can be raised or lowered to any given height. Proposed by Capt. Luoma, Fr. Campbell, Kentucky.

HANGING TRAPEZE—suspended over pool so that it can be raised or lowered. Proposed by Capt. Francis Luoma of US Army Hospital Ft. Campbell.

WHEEL CHAIR—aluminum and canvas wheel chairs which can be rolled into water by means of ramp. Proposed by Miss Maria Shaw, Sigma Gama Hospital, School Mt. Clemens, Mich.

ROLLING CHAIRS—chairs or platform with rollers are used to get children into pool who canot get there on their own power. Proposed by Dorthy M. Bauer, Minneapolis, Minn.

WATERPROOFED MOLDED SPLINTS—in order that men with broken wrists and forearms may enjoy the benefits of the water while in a cast. (Capt. Luoma.)

ROPE SUSPENSION—a length of shockcord (rubber rope) is suspended from ceiling and one end fastened to special belt on patient. Proposed by Lt. Col. John H. Kuitert while at Walter Reed Army Hospital.

UNDERWATER TREATMENT TABLE—George Allen of McKinney VAH in Texas used a Goal-Hi base as the main support for an underwater treatment table. Not as effective as the Lowman Plinth but it serves the same purpose.

Conclusion

Pool therapy, one of the many components of hydrotherapy embracing the use of therapeutic exercise assisted by the natural physiological benefits of immersion, is based on sound principles subscribed to by the medical profession. It is that unique phase of hydrotherapy which treats the whole individual rather than just a segment and has proven highly efficacious in the treatment of orthopedic disabilities. The use of this modality is deserving of even greater, recognition, exploration, and development by those engaged

(Continued on Page One hundred thirty-five)

HUMAN KINETICS IN SCHOOLS, HOSPITALS AND INDUSTRY*

T. McCLURG ANDERSON, F.F.Ph.**

Principal, Scottish Physiotherapy Hospital

An important development during the present century is the increasing appreciation of the part played by physical activity in relation to health, disease and injury. Practically every school now has at least one qualified physical educationist on its staff and routine periods are allocated for physical exercise and sports training. Most large industrial organizations have their sports clubs and many attempts have been made to introduce exercise periods during working hours, with varying degrees of success. The more extensive development of physiotherapy, remedial gymnastics, rehabilitation and occupational therapy has been an outstanding feature in hospitals since the National Health Service began to operate. To those who recognize the value of physical activity such developments are very pleasing, but at the same time stimulate some anxiety regarding end-results in the event of wrong types of movements being employed.

MUSCULAR HABITS

The state of living tissues is determined to a considerable extent by the functional demands imposed upon them. This is made obvious by the varied types of cumulative strain and occupational deformity resulting from repetitive work in industry. Muscular habits acquired by regular usage undoubtedly lead to structural accommodation of the softer tissues of the body and to modification of the neural paths through which impulses are distributed to the muscles concerned. It is in this connexion that the relationship between movements taught in schools and in hospitals has an important bearing upon industrial problems. Should wrong muscular habits be introduced in those institutions repercussions in industry must surely increase. In view of this possibility some investigation into types of movements associated with schools, hospitals and industry would be justified.

It is unfortunately true with regard to the physical effects of exercise that inadequate consideration is given to the influence of reflex mechanisms and the muscular habits which the exercises may develop. It is in this respect that the "kinetic" approach, which is based upon a thorough analysis of the above factors in relation to muscular activity, is so essential. As a rule, the study of muscular activity is generally related more to chemistry and mechanics, and the neglect of reflex influences is apt to lead to wrong conclusions so far as the living body is concerned. While the human body is subject to the laws of mechanics it frequently reacts in *opposition* to them. In Fig. 1, for example, we see the characteristic position of the learner on skates. Stiffness of the lower limbs resulting from insecure foothold leads to the body being unbalanced forward. For this reason the skater ought to fall forward, but in fact he usually falls *backwards*. The tendency to fall forward gives rise to strong contration of the calf muscles and to excessive pressure of the forefoot on the skate, so that sudden forward movement results in a backward thrust to the body. Reactions of this kind dominate many movements and when ignored in physical training they are likely to result on muscular stiffness and wrong muscular habits.

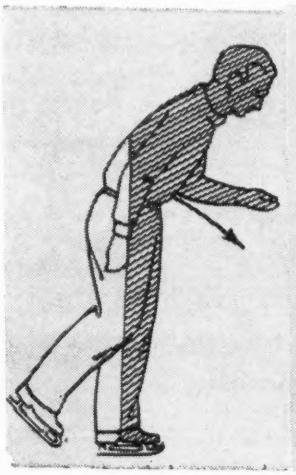

Fig. 1.—Position of a learner on skates.

Fig. 2.—The balanced position of an expert skater.

Fig. 2 shows the better balanced position of the expert skater, in which body weight is distributed along the length of the skating blade. The main feature of this position is that the knee is bent while the body is still erect and the plantar thrust reaction does not stimulate backward movement of the body.

DISABILITIES IN IDUSTRY

Fig. 3 shows a very common cause of industrial disability. The man concerned is a fleece inspector who suffered for many years from pains and excessive fatigue in the left upper limb and recurrent "lum-

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Fig. 3.—This man's feet are placed in first stage of movement only. When lifting to left, he tends to over-balance.

Fig. 4.—Correct position of the feet allows a "follow through" with a lift and so avoids strain in arm, shoulder and back.

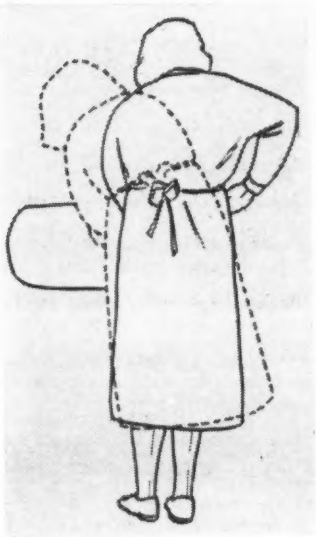

Fig. 5.—This method of cutting cloth imposes a strain on left lower limb and back, caused by an over-balancing of the body.

bago" affecting his right lumbar region. His job is to lift a sheepskin from the pile on his right, spread it on the floor for inspection and then lift it on to the pile on his left. His feet are placed for the first stage of the movement only, so that when lifting to the left he tends to over-balance and the muscles of his left lower limb reflexly stiffen. As a result, he has to stretch his arms out from his side and so overloads the left upper limb and the right side of his back. The objective evidence of this was apparent in the full and fibrous condition of his left deltoid and occipital trapezius muscles as compared with the same muscles on the opposite limb.

Fig. 4 shows how reasonable positioning of his feet allowed this man to "follow through" with his lift and so avoid arm, shoulder and back strain. The fleece inspector could have prevented his disabilities and loss of work if he had been trained to position his feet to adjust balance and so avoid postural stiffening before starting the job.

Fig. 5 shows a female worker cutting cloth in such a way as to impose the maximum strain on her left lower limb and back, subsequent to over-balancing of the body in what might be called a "top heavy" movement. This type of action is more obvious in females because of their greater tendency to stand with feet together. In this case also, movement of the top part of the body without preliminary adjustment of the feet would not arise if proper balance adjustment had been developed in early life. Instead, ordinary types of exercise commonly consist of such "top heavy" movements. The harmful effects of those unbalanced movements will be obvious when they are critically examined, yet we often see such actions carried out without appreciating the significance of the lower limb stiffness which is their outstanding feature. We are apt to assume that movements which are carried out constantly cannot be far wrong, but if we are trained to *ignore* the tension created by top heavy actions the natural sense of muscular economy may be suppressed.

RHYTHMIC MOVEMENT

Fig. 6 shows how much easier and rhythmic the movement can be when the feet are properly placed. The more rhythmic character of this type of movement not only makes the actions more pleasurable, but considerably reduces the fatigue and cumulative strain associated with the lower limb stiffness arising from the top heavy type of movement. Long practice of movements based upon kinetic principles has in fact demonstrated that, psychological influences apart, industrial movements can produce the healthy reactions usually associated with physical recreation.

The type of top heavy movement which develops postural stiffness in the lower limbs and back is a common feature of gymnastic exercises. In Fig. 7 we see an exercise included in the syllabus for secondary schools. This type of exercise actually develops the muscular habits which lead to so many disabilities in adult life. In exercises of this kind the intervertebral discs are compressed unduly as a result of the flexion and torsion actions taking place while the lower limbs are stiffened. Actions of this kind encourage and develop wrong muscular habits and must contribute to the frequency of disc and other back lesions in industry.

Another top heavy type of exercise commonly included in school and remedial exercise programmes is seen in Fig. 8 The postural stiffening of lower limbs

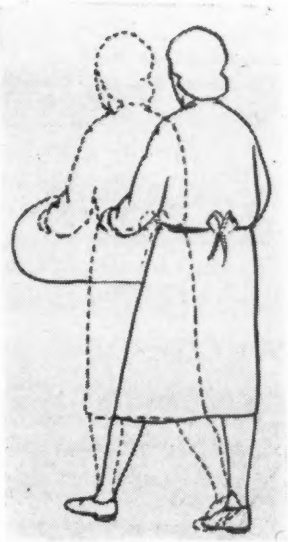

Fig. 6.—If the feet are placed properly, an easy and rhythmic movement in cutting cloth can be achieved.

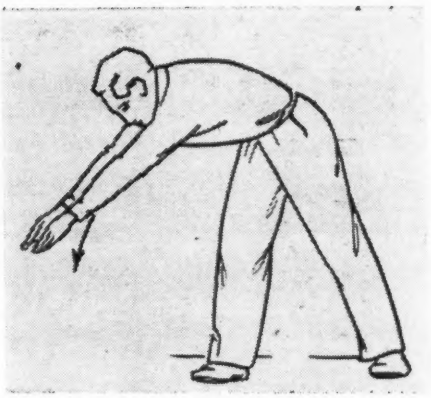

Fig. 7.—An unsuitable exercise often included in a school syllabus.

Fig. 8. — Another exercise commonly used in schools.

associated with this movement is accompanied by lateral compression of the intervertebral discs. While there is no doubt that the regular performance of this type of exercise will increase the range of spinal lateral movement, it encourages the muscular habits which lead to many industrial disabilities and its value is, for the same reason, rather doubtful. When lateral mobility of the spinal joints is required the exercise shown in Fig. 9 where the action takes place in the pelvis with the upper part of the body steady, can produce the desired result without undue compression of the discs.

Fig. 9.—An exercise for lateral mobility of the spinal joints.

Fig. 10.—An example of the reaction of muscles when the body is threatened with hurt.

PROTECTIVE FUNCTION OF MUSCLES

Those who evolved the principles of gymnastics did not have the knowledge of human physiology available today and too little use of this knowledge appears to have been made as modifications in gymnastic methods have been introduced. The fact that muscles are primarily guardians of the body seems to have been overlooked and little recognition has been given to the two predominant protective reactions which condition most of our movements: (1) *Withdrawal reactions* when the body is threatened with hurt; and (2) *stiffening reactions* when balance is threatened. A good example ofthose reactions operating together is shown in Fig. 10, where the threat of hurt to the ankle causes the body weight to be transferred quickly to the opposite limb. Immediately we tend to "go over" on the ankle, sensory impulses should be flashed to the spinal cord and brain. This should result in an almost spontaneous contraction of the flexor muscles and relaxation of the lower limb and back muscles, so that the body weight is transferred to the opposite limb. This unbalancing action should result in postural stiffening of the limb which takes the weight to prevent falling. Those protective reactions are likely to be less efficient when the

Fig. 11.—A method of falling associated with stiffening of the lower limbs, which results in many injuries.

muscles of the lower limb and back are trained to merely stiffen by repeated movements of the upper part of the body with the feet side by side.

WRIST, ELBOW AND SHOULDER INJURIES

Many wrist, elbow and shoulder injuries are stimulated by the top heavy type of exercise which complicates protective muscular reactions. Fig. 11 shows the method of falling associated with postural stiffening of the lower limbs and which results in so many injuries. Having cultivated the knack of relaxing the lower limbs and adjusting the positions of the feet when body balance is threatened, the writer has avoided many injuries during athletic and other activities. Even when suddenly and forcibly unbalanced, relaxation of the lower limbs reduces the impact of

Fig. 13.—An example of an unwise exercise for flat feet.

Fig. 14.—An exercise for forced exhalation.

Fig. 12. — Relaxation of the lower limbs reduces the impact of the body when forcibly unbalanced.

the body when it lands as shown in Fig. 12. Exercises which cultivate this quality would be more beneficial than the usual "strengthening" movements which tend to inhibit the normal protective reactions.

REFLEX REACTIONS AND STIMULI

In many types of exercise, especially when apparatus is used, the movements may produce the opposite effect to that desired because reflex reactions to hurtful stimuli are ignored. Fig. 13, for example, shows a popular exercise for "flat feet" in which the peroneal muscles are supposed to be stretched. In this case there is a conflict between the reflex withdrawal reaction arising from the hurtful pressure on the bases of the fifth metatarsal bones and the stiffening reaction produced by inadequate grip of the ground. Under those conditions the muscles which are supposed to be stretched are likely to become more strongly contracted than ever, especially when they have to carry a considerable amount of body weight with which they do not normally have to deal.

It is probable that many of the deficiencies associated with exercises given in hospitals arise because medical practitioners are more concerned with other problems of disease and injury than with the detailed analysis of muscle work involved in the movements. On the other hand, physiotherapists are apt to accept exercises prescribed without fully examining the reactions they are likely to produce. The exercise for forced exhalation shown in Fig. 14 is an outstanding example of the need for detailed examination of reactions. In this movement the aim is to compress the anterior chest wall with the hands and the action is rather suggestive of a car driver putting one foot on the brake while the other is pressing the accelerator. The hand pressure which is intended to compress the chest wall is brought about by contraction mainly of the pectoral, serratus anterior and latissimus dorsi muscles. The first two muscles arise from the anterior and lateral chest wall and the pectorals, which are the main muscles concerned in the action, tend to elevate the anterior chest wall as well as to adduct

the arms. This means that the pectoral muscles are "pulling against themselves" and that the more firmly the hands are pressed against the chest wall the more forcibly the pectoral muscles tend to elevate the ribs. When such exercises are practised constantly in a condition like asthma the end-result is likely to be an increase in the existing "muscle bound" condition of the intercostal muscles.

When a person is suffering from general physical stagnation almost any type of exercise will be stimulating, but the constant performance of exercises which conflict with protective muscular patterns is likely to react to the detriment of the individual. It is for this reason that physical training in schools and corrective exercises in hospitals should be considered in the light of normal functional activity. In both spheres, for example, the conception of "good posture" still tends to be based upon the idea of a straight spine with the feet side by side. This conception usually leads to the maintainance of positions by excessive muscular tension, which results in rapid onset of fatigue in the extensor muscles and an increasing tendency to spinal stiffness. The slightest movement of the upper part of the body when the feet are side by side results in postural stiffening of the lower limbs and back, which is the root cause of so many disabilities.

It is unfortunate that criticism of established methods is usually taken as a personal attack on those who practise them. When focussing attention upon the need for more detailed examination of physical exercises given in schools and hospitals the writer is not concerned with persons, but rather with patient problems and with the need for avoiding any tendency to reduce the value of physical training. The inevitable development of specialization as life becomes more involved tends towards isolated compartments and any tendency for physical training to be divorced from normal muscular habits should be avoided. Having devoted many years to the study of this problem, the writer is firmly convinced that detailed examination of exercises taught in schools and hospitals is urgently required, especially as they relate to physical reactions and muscular habits. Those who give instruction should have a more thorough training in analysing the reactions likely to be produced by the exercises they teach and in analysing the reactions likely to result from normal muscular habits.

SPASTIC GAIT—Cont. from Page 119

gait more unconscious and effortless, i.e. the development of automatism.

Alternation means that the movement of the extremities are independent of each other as they perform each one their assigned task which corresponds to the proper phase of the gait. The automatism, on the other hand, relieves the patient from the burden of concentration by making the movements of the gait more or less unconscious.

ALTERNATION

Efforts are made to combat concomitant movements by holding down one leg either manually or by heavy braces so as to compel the extremities to act independently. Then one extremity is free to carry out its movement independently of the other and is to be trained in this direction. This is an heuristic method based upon the same principle as is used in polio rehabilitation, and it may be all right to use it where the upper motor centers are intact. However, it is questionable whether this a profitable method for rehabilitating the spastic gait. The question is whether it is better to break sharply with concomitant movements, or permit natural innervational pattern to express itself and to rely on gradual suppression of concomitant motion by reflex control.

AUTOMATISM

As long as it is conceded that the spontaneously occuring reflexes should not be forcibly suppressed as part of the neuromuscular training, a long step is made toward developing automatism. A large part of the so-called voluntary movement is indeed involuntary. Stronger movements always call associated muscles into play. In the development of this automatism, the motivation, such as has been developed by the system of Plato-Schwartz, is an important factor. It focuses the immediate attention of the spastic on the objective itself and it draws it away from the conscious locomotor effort by which the objective is to be obtained. Of course, this principle applies, not only to the spastic gait but to any locomotor effort in spastic paralysis.

A PRACTICAL PHYSICAL ORIENTATION AND FOOT TRAVEL PROGRAM FOR THE BLIND IN A COMMUNITY

WILLIAM D. MARSHALL*

The purpose of this paper is to outline what is being done by a private agency for the blind in regard to physical orientation and foot travel. The training is based on the approach and techniques as they are taught the veterans at the Central Blind Section of the Veterans Administration Hospital, Hines, Ill. The program is unique in that the training is given in the familiar surroundings of the client's own home and community after he has, in most instances, first learned the techniques in an institutional environment and is now faced with the problem of adjusting the training to the conditions of his home environment.

Under this program, only those individuals who request the training are exposed to it. With an intial request from the client, the agency begins procedures to start the physical orientation and foot travel program.

The director of the agency and the orientation therapist visit the client in his own home. The client is given the opportunity to ask any questions that he might have concerning the training while, at the same time, the therapist is able to get an idea of the client's ability, coodination, perspective and acceptance of his handicap. On this initial visit the client is asked what he desires in the way of orientation and foot travel. It is often the case that the client only desires to be able to move about within his own home and to be able to perform the activities of daily living that will make him less of a burden to his family and, in this way, establish a certain degree of independence. The program is so devised that it will accommodate the requirements of this type of client as well as the desires of the client who seeks to travel about with a minimum of effort in the very heart of the city. The director of the agency informs the client that he will be required to produce a statement from his physician attesting to the fact that he is physically able to participate in the program.

The program itself is an individual approach. The client receives the undivided attentions of the therapist and at no time during the program is he exposed to a class-room method of instruction. The therapist has divided the physical orientation and foot travel training into five units of instruction.

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The first of these five units is *indoor travel.* In this unit the client is taught the correct method of following a sighted companion, the proper method of employing the cross body arm technique and the cross body cane technique when traveling in either familiar or unfamiliar surroundings, taking directions, sound interpretations, enlisting landmarks as aids in helping to move about and the correct method of tapping with the long aluminum cane. This last phase of indoor travel is the key to success and considerable time is spent in perfecting this technique.

When the client has mastered the technique of the long cane and it approximates perfection, he progresses to the second unit of travel. This unit is called *sidewalk travel* and is taught on the walks of a small college in the community. The reasons for using this particular area are that the client is able to become accustomed to the feel of the cane on the rough cement, experience having it stick in the grassy shoreline and, at the same time, not have to worry about stepping off a curb or walking into traffic. The sidewalks of this college are both straight and curved, obstructions such as trees and posts in the middle of the walk exist, and the travel hazards of sidewalks blending in with alleys without the identifying factor of curbs are present in this area. During the time that the client is becoming accustomed to outside travel, emphasis is still being placed on his cane technique. Upon the completion of this unit the trainee is moved into the third unit of travel.

The third unit is *residential travel.* In this phase of his training, the client is taken into a typical residential section of the city in which is located a shopping center. Each lesson in this unit is so arranged that the client locates some certain objective. It is during this unit that street crossings are introduced, with and without the benefit of a traffic light. The client experiences the generosity and cooperativeness of the general public in this unit of training and is taught the correct and courteous method to either accept or solicit aid. It is vitally important that good public relations exist between the blind and the sighted in the community if such a training program is to be successful.

The fourth unit of training is referred to as *neighborhood travel.* The therapist strives, through the lessons in this unit, to make it possible for the client

to travel about in his own neighborhood and locate such objectives as the corner store, friends' houses, the nearest bus stop and the corner mailbox. The client is familiarized with any unsual obstacles he may encounter within his neighborhood and is instructed in the proper method of overcoming these obstacles. In this unit, stress is placed on applying the finished polish to the client's travel. This is more easily accomplished when the client is traveling in a familiar area.

Downtown travel is the last unit of instruction. The client is familiarized with all ofthe main streets running north, south, east and west in the business district. He is instructed in the proper method of negotiating revolving doors and escalators. He is exposed to hotels, banks, bus and train stations and theatres. The final lesson of the unit and of his training consists of traveling alone from the therapist's office to any objective he might have encountered during his training. The lesson is so devised that he must make use of the public transportation system.

As was mentioned previously in this paper, good public relations are essential to a successful program. During their physical orientation and foot travel training, the blind clients are instructed in the proper and courteous way to deal with the public. The problem of educating the sighted to the difficulties encountered by the blind is handled by making use of the numerous resources available in the community, talking to priminent civic groups at luncheons and board meetings, making use of the medias of radio and television and employing the power of the press.

The progressiveness of this private agency in setting up and maintaining a practical program of physical orientation and foot travel and the all-out cooperation that it receives from the civic-minded citizens of the community demonstrates how interested society is in the problem of rehabilitation. The program is far advanced over the time when a blind man was given a red and white cane, told he was "in business," and then forgotten.

Therapeutic Exercise--Cont. from Page 121

e. The rate and extent of muscle hypertrophy is proportional to the resistance that the muscle must overcome.[13]

f. Swelling and effusion with maximum exertion in non-weight-bearing exercises is a rare occurrence.

g. Careful supervision of details is necessary for best results.[14] This includes gaining complete cooperation, concentration, and honesty of effort from the patient.[15]

As a result of the findings and conclusions reached in this project, the following recommendations are made:

The therapist should observe his patients carefully in their habitual standing and walking patterns, so that he can correct any imbalance as soon as it appears. This will serve as a prophylactic measure against the development of future quadriceps weakness and possible injury.[16]

The strength of the unaffected leg should be tested at regular intervals. In a number of cases this strength had increased considerably during rehabilitation. Since the amount of strength in this unaffected leg is the goal for the affected leg, an accurate estimate of the strength of both legs is essential at all times.

The attachment of weights to the leg has proven its value in muscle development, but its accuracy in testing strength has been questioned. It is suggested that further experimentation be carried out to determine the most precise and accurate method of measuring the strength of the quadriceps as well as of other muscle groups.

The concepts which evolved and the techniques which developed as a result of this project report can be adapted to most areas of the body with a small amount of ingenuity. The hip, ankle, shoulder, elbow, wrist, abdomen, back and neck can readily be included. Therapists should investigate these possibilities in order to better serve the disabled through muscle reconditioning.

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[14]ZINOVIEFF, A N.: The "Oxford Technique", *British Journal of Phy. Med.* Vol. 14, 1951, p. 128.

[15]DAWSON, C.: An Intensive Exercise Program for use in knee surgery. *Arch. Phy. Med.* Vol. 34, No. 12, 1953, p. 750..

[16]KLEIN, K. K.: Research: Comparison of Bilateral Quadriceps Strength as Related to Good and Bad Standing Posture. *J. Ass'n. Phy. Ment. Rehabil.*, Vol. 6, No. 1, 1952, p. 16.

Acknowledgement

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SOME PSYCHIATRIC CONCEPTS OF CORRECTIVE THERAPY

H. K. ELKINS, M.D.*

Corrective Therapy is a relatively new discipline. This is not to say that the procedures which we use in Corrective Therapy are new – some of these have been used for ages, in the same manner that "common sense" was used long before psychiatry became a formalized branch of medicine. But, as an organized branch of rehabilitation work, Corrective Therapy is relatively new and is now in the process of developing its scientific principles much as Physical Therapy and Occupational Therapy have done in the past. It has the job of writing its own "Position Description" so that it and other disciplines will better understand what its rehabilitation task is.

The Corrective Therapist has concerned himself thus far with two aspects of Corrective Therapy: (1) the use of certain specific activities for therapeutic purposes; e.g., displacing hostility via the punching bag, competitiveness and cooperativeness in group games, the achievement of sedation through heated swimming pools, etc., and (2) the belief among authorities that the success of therapy may be contingent more on the ability of the therapist to relate with his patients than to specifics in the modality he uses. Both these aspects of Corrective Therapy are important considerations. Another area of inquiry pertinent to the aims and goal of Corrective Therapy is pointed out in a recent editorial in the Journal of the Association for Physical and Mental Rehabilitation,[1] "Although the field of corrective therapy has contributed considerably to an expanded program for the modern psychiatric hospital, there has become evidenced a concomitant need to more fully evaluate the dynamic processes involved in activity itself."

What are the dynamic processes involved in motor activity per se? This problem becomes increasingly important in work which deals with patients' activities in a neuropsychiatric setting. We know activity treatment has varying and different meanings to different patients. For many psychotic individuals, unreachable by the usual somatic or verbal types of treatment, activity is largely all we have to offer. Empirically, we know it is helpful for many. For others, activity treatment seemingly offers little or nothing. When we understand more about the dynamics of activity, we may be better able to determine and prescribe the relative merits of psychological (verbal) and physical activity approaches to treatment.

In the normal person, there is a feeling of well-being which pervades the whole person following physical activity, when activity is not pursued to the point of fatique—"Mens Sana in Corpore Sano." Many examples could be cited: the necessity of physical play for the normal child, the feeling of physical and mental well-being following a long walk, a swim, exercise, work, the shower and the rub-down. The "Joy through Strength" Philosophy, is understood and used in mass athletics, Sokol organizations and was used in camps and training centers during the war when it was so thoroughly recognized that physical activity did much to keep up both physical and psychological health.

In order to make more clear what is meant by activity per se, I should like to quote from a letter sent to Dr. Karl Menninger by a woman patient, the account of which appeared in the Bulletin of the Menninger Clinic[2] a year ago.

Dear Dr. Menninger,

Re pts. in seclusion rooms after thirty years or so of incurable schizophrenia who like to smash beds, etc.: We people have a constant terrific craving for eye-hand, eye-foot, eye-ear and foot-ear coordination. Our whole desire is in touch. This sense is more than touch sensitivity of the blind. - - - - - -.
Long ago they took materials away in Occupational Therapy because I ruined them. Well, I am like the picture of your patient in a recent magazine sitting on floor, head bowed.
Recommendations:
Paste large squares of flowered wallpaper with scotch tape on walls of seclusion rooms and give pencils to trace around flowers with.
Let them toss oranges also for eye-hand coordination even if costly and messy inside seclusion rooms.
Singing and screaming releases the fierce energy in us.
Please don't put us in packs. The need for constant movement is accentuated in the demented.
At home I climb up and down stairs hundreds of times a day. Put safe stairs like Montessori steps in seclusion rooms. Climbing instinct.
We no longer take in anything on television or radio. All of our energy has gone from the brain into the body which must move, move, move—.
Please explain this to our nurses.
We hardly know that we are alive at all after years of shock treatment and all the rest. - - - - - -.
All of our energy has gone from the brain into the body which must move, move, move—.

Why is this so true of some persons, less true for others? These are problems which I believe pertain to the dynamics of activity. No single point of view

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[1] Editorial, *Journal of the Association for Physical and Mental Rehabilitation*, Vol. 8 No. 5, Sept.-Oct. 1954.
[2] *Bulletin of the Menninger Clinic* 18:17-18, 1954.

can explain the phenomenon of motor activity. From the psychiatrist's point of view, physical activity may be looked upon as having three aspects. First, there is the private feeling which is felt by the individual and which may be interpreted by symbols such as verbal language or body language. In the mentally ill person, the latter method of communication is more commonly used. Second, there is a complex set of physiological changes which are set up in the nerves, viscera, glands, and muscles. These make the characteristic stirred-up internal state which was felt by the patient who wrote to Dr. Menninger. Finally, there are the patterns of behavior or outward motor expression which overtly express the internal state. These outward patterns of expression may mean different things to different individuals because of variants in their social backgrounds. It is necessary to consider all three aspects. It is also important to recognize that the final overt expression of feeling causes various changes in the environment which register back via the sense organs and change the original private feeling. These three aspects of activity may be called the physiological, the psychological, and the cultural or social points of view.

Personal feelings may be expressed by both verbal and body language. It is the task of the psychiatrist to understand what emotions prompt one individual to pace restlessly, another to kneel on the floor and sway, and still another to beat furiously at a punching bag or a clump of bushes. Such activity may result from feelings of failure, fear, anxiety, omnipotence, aggression, etc. Locomotor organs may be used to get away from things which are felt dangerous, including a patient's sensation that his own feeling are dangerous and he must flee from them.

Physical restrictions arouse latent or new emotional conflicts. In a General Medical and Surgical Hospital, the bed-ridden patient sometimes sees his inactivity as damage to an idealized self-image, so that feelings of inadequacy and depression ensue. These feelings may have strong sexual connotation so that a whole new flood of emotional problems is opened up. To other patients, physical restrictions offer an opportunity to feel helpless, to be taken care of, and thus feed into a regressive process for him.

From the psychological point of view, the psychiatrist is also interested in the differences in which the two sexes seem to orient themselves to their environment. At a rather early age, somewhere before three, when the child is not yet consciously aware of sexual differences, the male child already tends to orient himself in an exploring, probing, or what Eric Erikson describes in *Childhood and Society* as an "intrusive mode." This intrusive mode characterizes much of the activity thinking and emotional life of the small boy and takes such forms as intrusion into space by vigorous locomotion, intrusion into other people's minds by aggressive talking, and into the unknown by consuming curiosity. There is an insistence on pleasure of conquest, competition, on "making" or "doing."

In the female, this period in early childhood is characterized by a teasing, inviting or provoking approach to environment. She manifests this approach by making herself attractive or endearing to others by what may be called a "snaring" or "inclusive mode" of behavior.

How private emotion is translated into a stimulus to any of the body's physiological systems is not yet completely understood. Both somatic (voluntary) and visceral (involuntary) nervous systems may be so stimulated.

Emotion, when translated to the involuntary nervous system, may yield blushing, sweating, changes in pulse or respiration and undoubtedly has a large role in peptic ulcer, hypertension, asthma, ulcerative colitis, etc. The problem of emotion and its effects on physical well-being is the particular concern of psychosomatic medicine.

Emotion, when translated to the voluntary nervous system, may give rise to "unconscious" acts which seem to occur without, or in spite of, one's conscious ability to control. The automatic clenching of fists, the wringing of hands, the sudden impulsive gestures and movements of the body in an emotionally laden sports event are all examples of how emotion may help determine physical movement.

Neurologically, to a considerable extent, we can trace the tracts in the brain through which emotion seeems to be channeled into the voluntary and involuntary nervous systems. Leukotomy is believed to cut some of these channels and reserpine is believed to have its action on portions of this route within the brain.

Weston La Barre in his paper on the *Cultural Basis of Emotion and Gestures*[3] gives many excellent examples of how the physical expression of emotion in one culture is open to serious misunderstanding in another. "There is no 'natural' language of emotional gestures," he states. "The allegedly 'instinctive' nature of such motor habits in personal relationships is difficult to maintain in the face of the fact that in many cases the same gesture means exactly opposite, or incommensurable things, in different cultures. Hissing in Japan is a polite deference to social su-

[3] WESTON LA BARRE, "The Cultural Basis of Emotions and Gestures," *Journal of Personality*, XVI, 49-68, 1947. By permission of Duke University Press.

periors; the Basuto applaud by hissing, but in England hissing is rude and public disapprobation of an actor or a speaker. Spitting in very many parts of the world is a sign of utmost contempt; and yet among the Masai of Africa it is a sign of affection and benediction, while the spitting of an American Indian medicine man upon a patient is one of the kindly ofices of the curer. Urination upon another . . . is a grave insult among Occidentals, but it is part of the transfer of power from an African medicine man in initiations and curing rituals."

Lest we place incorrect valuative importance upon motor activity because of the limitations or prejudices of our own personal or cultural point of view, we must be aware of the greater general dissimilarities between peoples with cultures in which the meaning of activity may be very different from ours. The Western world has placed special emphasis on man's materialist relationship to things: making and doing are reflected in our attitude towards games, sports, and the value of *things*. To "tackle a thing," and "the know-how" are part of our cultural orientation and may have valuative significance for us. We tend to believe this materialist orientation towards things is "good," and that the lack of this orientation constitutes a fault.

Even within our own culture, considerable differences within individual backgrounds exist. Some patients come from family or social backgrounds where no special emphasis has been placed on games, sports, or physical activity. Such individuals are culturally conditioned to express themselves in other ways.

Summary

The Corrective Therapist has the problem of understanding the dynamics of physical activity. Several factors help determine activity:

1. The original private feeling within the patient.
2. The extent to which this feeling is expressed via motor (muscular) routes.
3. The mode of motor expression, which may be "intrusive" or "inclusive" in character.
4. The cultural or personal social background of the patient.

VA CONDUCTING PSYCHOLOGICAL STUDIES ON TB

Veterans Administration is doing something about the warning of the great medical teacher, Sir William Osler, that the fate of tuberculous patients depends more on what is in their heads than on what is in their chests.

Psychologists, working with physicians who specialize in the treatment of tuberculosis, are conducting a wide variety of studies to determine what TB patients think about that may worsen their condition and what may be done to prevent such thoughts or counteract them.

These studies are going on in 14 of VA's 21 TB centers and in many of VA's psychiatric and general medical hospitals which have TB wards.

The most serious problem under study is that of irregular discharges — TB patients leaving hospitals against medical advice before their treatment is complete.

VA estimates that one-third of all TB patients leave hospitals in this manner, frequently to return again after the disease has spread.

The failure of these patients to tolerate hospitalization makes their cure uncertain and endangers the lives of others with whom they come in contact at home and in the community, VA said.

The studies of VA psychologists are aimed at detecting such tendencies as early in hospitalization as possible and working out method and techniques which may prevent these departures from hospitals against medical advice.

Among the approaches to the problem are personal interviews, psychological tests, observations of ward doctors and personnel, and careful investigation of all patients' complaints as a key to their thinking and emotional reaction.

Some of the methods being tested to counteract irregular discharge tendencies are patient education, group meetings with patients to discuss mutual problems, films and talks to provide a better understanding of illness and the source of their worries, and even patient councils to discuss medical procedures and treatment.

Psychologists are aware that an understanding hospital staff can do much to improve patients' morale; so meetings are held with the medical staff at which the psychologists explain the patients' emotional needs. This information is used by the staff to plan an integrated approach to treatment.

VA said the irregular discharge program is too young as yet to be fully evaluated, but it shows hope of reducing the number of TB patients who go AWOL before their treatment is complete.

Other studies are exploring the effect that emotions and personality factors may have upon body functions in reducing resistance to TB and thereby interfering with healing process. VA said this is a potentially serious problem in the treatment of tuberculosis.

Still other studies include the development of methods to teach relaxation so patients may obtain maximum rest in bed and thus give their lungs a better chance to heal.

One of the chief worries of TB patients is a satisfactory job after discharge which they may fill without danger to their health. For these patients, VA counseling psychologists, through early interview and the use of vocational tests, can reassure them of their employability and identify the special interests, skills and aptitudes which they may have. The staff then can arrange with rehabilitation workers for exploratory work experience prior to the discharge of patients from the hospital.

In this manner, VA said, the patients build up their physical tolerance for work at the same time they explore their own adaptability to new vocational skills. Job worries thus may be banished, permitting the patients to derive the full benefit of their medical treatment.

VA said its psychologists are using these and many other methods to cope with the mental and emotional factors associated with the disease as a concerted approach to Osler's injunction that what goes on in a TB patient's head affects the outcome or result of what goes on in his chest.

Therapeutic Pools—Cont. from Page 124

in the field of physical and mental rehabilitation. It is my sincere wish that the material presented by this panel will, at some future date, provide information and arouse interest in those present, so as to contribute to the welfare of the many patients who may benefit from this most desirable medium of treatment.

"From Other Journals"

G. K. ROSE, "Treatment of Osteo-Arthritis of the Knee Joint," *Rheumatism,* 11:36-43, April, 1955.

Osteoarthritis is essentially a wearing out process where attrition of joint cartilage has exceeded its regenerative power. The tonic support given to worn joints by their associated muscles is the greatest single factor determining lines of treatment. This is especially true for the knee joint because of its anatomical and functional characteristics. Basically a quadriceps exercise should consist of a tightening of the quadriceps tendon with the knee as fully extended as possible, the attention of the patient being drawn primarily to the necessity of pulling up the patella by "clenching" the vastus internus. Contraction should be slow, rhythmical, held for a second, relaxed completely, rested a second and contraction started again. The importance of the vastus internus cannot be over-estimated. This exercise is the basis of all treatment of osteo-arthritis of the knee joint. Patients must do it for a few minutes every day of their life if they are to avoid further trouble. In some patients low repetition, high resistance exercise must be used. A weight attached to the foot should be used; pulley attachments usually produce the maximum resistance at the wrong place. Instruction must be given in the correct manner to walk. It takes three months of concentrated exercise to ensure a safe basis of muscle tone; improvement continues up to six months. Good posture, the avoidance of overweight and the insistence of daily exercise are important preventative measures.

PJR

A. R. SHANDS, JR., "The Attitude of the Physician Toward Rehabilitation," *Journal of Bone and Joint Surgery,* 37-A: 371-373, April. 1955.

Rehabilitation is the complete process of getting well. About 30% of the physicians are interested only in the treatment of the specific complaint which brings the patient to the doctor. About 50% know that something should be done for the patient beyond medical care, but they do not want to be burdened with the responsibility for its accomplishment. About 15% of all practitioners would like to do more, but have never been shown how they may participate. Not more than 3% are deeply interested in and definitely appreciate the tremendous social and economic value of rehabilitation programs. A fraction of 1% are specialists in the field of physical medicine. How every practitioner can be convinced that it is his responsibility to direct the rehabilitation of his patients after medical care is the most vital and serious question in this field of medicine.

PJR

TEMPLE FAY, "The Origin of Human Movement," *The American Journal of Psychiatry,* 111:644-652, March, 1955.

The problem of human paralysis is basically dependent upon the origin, purpose and function of the component factors which have given rise to the human motor expressive system. The key to the entire evolutionary sequence lies in the comparative anatomy of the vertebrate nervous system. The function of the 12 pairs of cranial nerves has scarcely altered in the ages from fish to man. The vertebrate structure arose in a belly-down position, moving horizontally for the most part. The challenge of rehabilitation is to supply or substitute simple basic motor performances. When an individual is supine turning the head toward the side is accompanied by a lateral movement of the eyes and an extensor movement of both extremities on the same side (tonic neck reflex). This movement is characteristic of fish. With the cerebral spastic patient the neck reflex may be used as a timer and the parts on the advanced side may be passively moved downward and backward as the head turns to meet the advancing pair of extremities on the other side. By alternating these patterns as the head is turned an amphibian crawling type of movement may be induced if the pathology is one primarily of spastic nature and lies above the thalamic level involving chiefly the pyramidal motor system. Continued practice of this movement leads to the contralaeral member advancing. This is known as the "crossed diagonal pattern" and is best seen in the turtle. The use of crutches or bars in walking defeats the sequence. Support of the patient by a ring affixed to a firm vest situated over the upper thoracic spine attached by a pulley to an overhead bar offers free use of head-neck and upper extremities in the proper practice of walking. With paraplegics repeating the Marie-Fox procedure 30-50 times relaxes the adductors and reduces spasticity so that therapeutic and training efforts may be more easily accomplished. The spastic hand can be easily "unlocked" by placing it over the buttocks (patient prone) when the head is turned away from the side involved. Tight flexion of the forearm yields to lifting the elbow to the shoulder level and rotating the humerus 30 degrees. The arm may then be easily straightened by drawing it downward and backward. The survey of the origin of human motion has given us new avenues of approach to the problems of spastic pathology and the eventual rehabilitation or aid to the defective cerebral nervous structure.

PJR

J. MCKENZIE, "The Foot as a Half-Dome," *British Medical Journal,* 4921:1068-1070, April 30, 1955.

Although the foot is usually described as having medial and lateral longitudinal arches, there are sound reasons why it should be compared to a half-dome, the weight being transmitted from the talus to the periphery of the foot. (1) The trabeculae of the bones indicate the direction of weight transmission. (2) In coming down on the heel and pushing off with the toes a walker bears weight in turn from behind forward on all the half-arches. (3) By comparing the foot to a half-dome, we get a better understanding of the deformities seen in flat foot.

PJR

S. MALVERN DORINSON, "Physical Medicine for Injured Hands," *California Medicine,* 82:319-321, April, 1955.

After anatomical healing of an injured hand has taken place there is usually stiffness resulting from edema, shortening of soft tissues, disuse and pain. Heat, massage, electrical stimulation and passive exercise are useful, but active exercise is the major and most effective part of the treatment. The hand uses at least six grasping patterns and all of these should be worked upon with an exercise routine. Squeezing a rubber ball is a mistake, for balls are usually so large and firm that they cannot be squeezed down by a normal hand. Use of a rubber sponge or bulb is much better. The thumb almost always needs strengthening, particularly of the opponens and abductor muscles. Strengthening exercises must be given the muscles of the forearm, particularly the long flexors and extensors of the wrist and fingers. Spring handles, bulbs of varying resistance, weights and pulleys are used to gradually increase the difficulty of an exercise.

PJR

ARTHUR H. NORRIS, NATHAN W. SHOCK and MARVIN J. YIENGST, "Age Differences in Ventilatory and Gas Exchange Responses to Graded Exercise in Males," *Journal of Gerontology*, 10:145-155, Spring, 1955.

A group of young men and two groups of older men performed work bouts by cranking an electrodynamic brake bicycle ergometer manually while recumbent. Older subjects attained a higher level of ventilation volume than did the young. At higher levels of work they showed an impairment of oxygen uptake which was not associated with any impairment of carbon dioxide elimination. None of the older subjects admitted tiredness of the arms, while most of them complained of difficulty in "getting their breath." They were less efficient at rates of work where good coordination of muscle effort was necessary. This may be due to derangement in the timing of contraction and relaxation of antagonistic muscles. The decrease with aging in conduction velocity of nerves and the decrements in pursuit and reaction speed suggest a possible basis for coordination failure.

PJR

J. JOSEPH AND A. NIGHTINGALE, "Electromyography of Muscles of Posture: Thigh Muscles in Males," *Journal of Physiology*, 126:81-85, October, 1954.

Most subjects stand at ease without any detectable activity in the quadriceps or hamstrings, due to the fact that the line of weight usually falls in front of the center of the knee joints. If the line of weight falls behind the center of the knee joint, the quadriceps contract to prevent flexion of the knee joint. Raising the arms forward or swaying forward are associated with marked potentials from the hamstrings. Probably shifting the weight forward causes the hamstrings to contract to prevent flexion at the hips. (An earlier study by the same authors demonstrated that the soleus is active in all subjects when standing at ease. In over half the subjects the gastrocnemius was also active, but no potentials were recorded from the tibialis anterior.)

PJR

MASAZUMI KAWAKAMI, "Training Effect and Electro-Myograms," *The Japanese Journal of Physiology*, 5:1-8, March 30, 1955.

Much effort has been done on the effects of training in relation to histological, morphological, anatomical or biochemical changes of skeletal muscle, but little has been done to elucidate the 'learning effect' impressed on the somatic nervous system. EMG records of certain muscles of stevedores were compared with those of individuals not accustomed to heavy work. The discharge rates of the trained men were slower and more regular, indicating smooth contraction. Training for heavy and static effort or a newly acquired movement probably brings about a functional rearrangement in the cerebral cortex, and in this afferent impulses from the proprioceptors play a weighty role. Lack of exercise results in an inactivity of the tonic element, resulting in unevenness of movement.

PJR

"Medical Aspects of Athletics," *British Medical Journal*, 4920:1026, April 23, 1955.

At a meeting of the Harveian Society Sir Adolphe Abrahams stated that in dealing with major injuries to athletes the general principles of surgery prevailed, but in minor injuries the athlete expected restoration and in the shortest time. He doubted whether any authority would agree that there was such a thing as a "strained heart" in the case of a healthy heart, but warned against taking any violent exercise in a pyrexial condition. Dr. Roger Bannister declared that athletes were essentially hypochondriacs, almost superstitious about health and likely to consider themselves and their training methods much too seriously. Sir Arthur Porritt pointed out that rugby, soccer, polo and lacrosse were hazardous sports; boxing and hockey were of medium risk; swimming, golf, tennis and other non-body contact sports were safe.

PJR

"Rugby Football Injuries," *British Medical Journal*, 4906: 154-155, January 15, 1955.

In a review of 590 cases of injuries sustained by Rugby football players, T. C. J. O'Connell stresses the importance of maintaining muscle tone. "Taking up the slack" is the most important measure in injury prevention and in the restoration of fitness. The strength of joints depends upon the muscles above and below them, not upon the ligaments. A player returning to the game before fully regaining muscle tone lays himself open to further damage. A player should not take part in a game if he is feverish or has a septic infection. Warming up is a useful insurance against injury. In cold weather many strains and muscle injuries occur in ill-trained individuals early in the game. The only real training for Rugby is Rugby.

PJR

E. WOODBRIDGE, "Motor-cyclists' Protective Hats," *British Medical Journal*, 4875:1380, June 12, 1954.

The British Standard for protective hats for motor-cyclists includes that the outer shell shall be durable, smooth and free from projections; it shall be attached to an inner harness with space between the harness and the outer shell; it must withstand impact tests [a 4 lb. weight falling 4 feet shall not displace the shell towards the top of the head harness by as much as 1 in.], pressure tests both fore and aft and sideways [a fore and aft or side-to-side thrust of 30 lbs. shall deform the helmet less than 1-¼ in.]. and a test of the chin strap to ensure that the helmet is not likely to come off in an accident. The only new feature which is at present being considered is the possibility of incorporation additional padding between the harness and the shell.

PJR

WELDON J. WALKER, "Needless Restriction of Patients With Healed Myocardial Infarction," *U. S. Armed Forces Medical Journal*, V:1717-1723, December, 1954.

Often a patient who had survived a myocardial infarction is advised to "restrict your activity." There is considerable evidence that such restriction may be detrimental to the patient's health and chances for survival. Demonstrable coronary artherosclerosis was found in 77% of the U. S. soldiers killed in Korea. If physical exertion is dangerous for patients with this disease, every adult American male should creep to the nearest wheelchair. In 1937 Glendy and others reported that Americans who had myocardial infarctions early in life came largely from sedentary groups, while those who maintained good health beyond 80 years of age had engaged in more than average amounts of exercise. The idea of restricting myocardial patients seems to rest upon failure to separate angina pectoris from coronary artery thrombosis. We make a grave mistake by not explaining to each patient with a myocardial infarction that, following recovery from the acute episode, the condition for which strict restriction was ordered no longer exists. Such restriction deprives him of the ability to discharge emotional tension through physical activity, anxiety is increased, he consoles himself by eating, weight gain results. and the stage is set for progression of the artheromatous process and for his early demise.

PJR

"Soap-Wrappers Jig," *Journal of the American Medical Association*, 157:1329-1330, April 9, 1955.

The management of a perfume factory in England called in the Medical Research Council's Industrial Psychology Research Group to investigate the rhythmic movements made by women in their soap-wrapping department. These consisted of rhythmical swaying of the trunk and rotation of the head. The greater the jigging the greater was the efficiency. The correlation between jigging and efficiency means that working to rhythmic movements is more efficient than working without them. As the jig is not the cause of anxiety to the workers and ceases when work is stopped, it probably does no harm.

PJR

Research

REMEDIAL EXERCISES IN ANKYLOSING SPONDYLITIS. PART 2. PASSIVE EXERCISES.

Summary:

1. In our earlier papers, we have repeatedly dealt with the complex treatment and active exercise in ankylosing spondylitis. Passive exercise is important in cases, where movements are limited due to muscular contractures and especially where fibrous changes in muscles and soft tissue have set in. In such conditions assisted and passive exercise are indicated.

2. Prior to the commencement of passive exercise, the patient must be taught to relax the muscles, which are to be subject to passive movements.

3. The passive movements are carried out on a table in prone or supine position or with the patient sitting astride the table.

4. General rules for passive exercise are given.

5. The following sequence for passive exercise in ankylosing spondylitis is observed by the authors

I. Some introductory exercises.
II. Exercise of the shoulder and sternoclavicular joint.
III. Exercise of the hip joint.
IV. Loosening of the cervical spine.
V. Exercise of the whole spine.
VI. Breathing exercises.
VII. Underwater exercises.
VIII. Lying in correcting position.

Ad II. The most limited movement, in the shoulder, is the outer rotation combined with elevation of the arm. It is due to the shortening of the pectoral muscles in patients presenting arcuate kyphosis of the dorsal spine.

a) Elevation of the outward rotated arm (Fig. 1).
b) The patient is requested to seize his forearms with the hands of the opposite side and the gymnastic instructor tries to get the patient's forearms above his head by elevating his arms (Fig. 2).
c) From arm raising sideways the arms forward raise is performed and then the arm is crossed in such a manner that the patient's hand touches the opposite shoulder-blade (Fig. 3).
d) Abduction of the arm is continued until the arm is raised upward (Fig. 4).
e) The patient has his hands crossed at the back of his neck while the instructor is pressing his elbows backward (Fig. 5).

Ad III. Exercise of the hip joint.

a) Flexion of the hip joint with simultaneous flexion of the knee (Fig. 6, 7).
b) Inner rotation of the hip joint (Fig. 8).
c) Outer rotation with abduction of the hip joint (Fig. 9).
d) Simultaneous flexion of the hip joint and the lumbar spine (Fig. 16).

Ad IV. When performing passive movements of the cervical spine, the instructor must exercise the greatest possible caution, the spine being mostly osteoporotic.

a) Flexion of the cervical spine (Fig. 10, 14).
b) Extension of the cervical spine (Fig. 11, 15).
c) Lateral flexion (Fig. 12).
d) Rotation (Fig. 13).

All these movements can be carried out either in a supine or a sitting position (astride the table).

Ad V. For the exercise of the entire spine two instructors are always necessary.

a) Flexion (Fig. 16, 17)
b) Extension in the ventral recumbent position (Fig. 18, 20).
c) Lateral flexion the patient lying in the lateral position (Fig. 19, 21).
d) Rotation of the spine (Fig. 22).

Ad VI. After the completion of the passive movements breathing exercises are performed in the dorsal recumbent position. For this purpose the abdominal waul is fixed by means of a broad band of linen (bed sheet) to make abdominal breathing impossible (Fig. 23).

VII. Underwater exercises are instituted in a hot pool, where the patient is placed so that even his cervical spine is under water. At the edge of the pool there must be an appropriate device for the patient to hold on to. As in the dry gymnasium, the different parts of the body are exercised successively. The special positions of the patient and holds of the instructors are seen in figures 24, 25, 26, 27.

VIII. Lying in a corrective position.

By placing the patient in a correcting position we intend to act through pull or pressure on the whole body or one of its parts in order to correct a faulty posture. The effect of the weight of the patient's own body is increased by the use of sand bags.

a) By laying the patient in a prone position, maximal extension of the lumbar spine is intended (Fig. 28).
b) By placing the patient in a supine position, extension of the cervical spine is the main goal of the treatment (Fig. 29).
c) When the hip joint is fixed in a flexion the patient is lying in the dorsal recumbent position with knees weighted down by sand bags.

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Editorials

A MOST SUCCESSFUL CONVENTION

During the waning days of June, Boston staged its first heat wave of the season but even this fact did not deter a large and enthusiastic group of corrective therapists and other rehabilitation personnel from enjoying one of the most successful conventions in the association's history.

This was a week of highly professional and effectively organized meetings in which the prominence of the Boston area in medicine and rehabilitation was well demonstrated by the large percentage of panelists and speakers from the Hub who accepted invitations to participate in the convention this year. The program, organized on a broad base to emphasize the scope within which corrective therapy operates, included contributions from various medical specialties as well as from such allied fields as psychology, education, state and federal agencies, administration, and the rehabilitation field in general. Once again, the diverse elements which coordinate to form the concept of total rehabilitation was aptly emphasized. However, lest one have the erroneous impression that the convention program was aimed at a generalized discussion, it should be pointed out that the major part of the program dealt with the philosophies, techniques, scientific background, and methods involved in treating patients within specific categories by the use of corrective therapy. The contributions of the corrective therapists themselves in participating on panels as well as in presenting professional papers was outstanding at the Boston meeting.

Whenever an organization selects a particular city as the site of its annual meting, public officials and civic-minded persons in the community are aware of the responsibilities entailed. The city's reputation is involved in such instances and progressive communities have taken steps to ensure or enhance this reputation. In the case of our Boston meeting, the hospitality of this historic city was most generous and unquestionably, delegates came away from the meeting with the impression that Boston had been a most excellent choice of convention site.

Particular credit for the success of the Boston conference should be accorded Frank S. Deyoe, convention chairman and the various committeemen who worked under him. This was a very successful meeting in every respect and one which will long be remembered.

A NEW DEFINITION

At the recent Ninth Annual Conference of the Association in Boston, the Board of Governors voted approval of a new definition of Corrective Therapy. This action marked the conclusion of two years of considered study and careful evaluation of the problem of definition and included an appraisal of the definition by the Advisory Board.

In attempting to define our discipline, it was decided to limit the selection of words to an expression of a philosophical concept rather than to attempt to describe everything that corrective therapists attempt to do and the means by which they accomplish their objectives. Realizing full well that any philosophical statement requires amplification, there has also been prepared a statement on scope, procedures and techniques which it is felt will explain what corrective therapy does and how it does it, bearing in mind that therapists administer treatment on medical prescription, aimed at the accomplishment of objectives established by the physician.

The definition officially approved by the Association states that *Corrective Therapy is the application of the principles, tools, techniques and psychology of medically oriented physical education to assist the physician in the accomplishment of prescribed objectives.*

In approving the definition this year (it had approved the statement on scope, procedures and techniques last year) the Board of Governors, recognizing the need for flexibility, accepted the recommendations of the Definition Committee and urged continuing study in the area of definition, scope, procedures and techniques. As our dynamic discipline grows and substantiates itself with more and more scientific investigation, undoubtedly this definition and its amplification will require modification and enrichment.

The work of the committee on definition, headed by Edward D. Friedman, is to be congratulated for its intensive study of this entire problem.

CORRECTIVE THERAPY AND ORTHOPEDICS

If one were to select any single medical area for the initial training of a corrective therapist there would be many reasons for selecting the field of orthopedics.

In general, the objective of orthopedic surgery and management is restorative in nature, aiming pri-

marily at enabling the patient to recover the useful function of the diseased or injured part. It is logical to assume that fundamental principles of rehabilitation play a most important role in augmenting surgery to aid surgeons in accomplishing this objective. Corrective therapists have been widely used in the rehabilitation of orthopedic patients not only to supervise exercises and activities for increasing the strength, power and endurance of affected muscles and to increase joint range but also to provide instruction of handicapped patients in matters of mobilization and functional recovery.

The newly appointed corrective therapist has an unusual opportunity on the orthopedic service to use a multitude of techniques because of the wide range of diagnoses and the fact that patients are in varying stages of convalescence and rehabilitation. Thus, the therapist's knowledge of the application of anatomical and kinesiological principles will be thoroughly tested here as well as his skills in following the prescription in regard to the type and degree of exercise administered, activities of daily living and ambulation in all of its aspects.

There are several fortunate circumstances in working with orthopedic patients through corrective therapy: The progress of the patient can be assayed quite readily and indications for advancing him to more specialized types of activity are usually easily discernible. The therapist is constantly motivated by the precept that functional recovery will occur more rapidly and with better results in a supervised program of exercise and functional training than if this important matter were left to the patient's own devices. This is the raison d'etre for much of our work in rehabilitation and one from which considerable satisfaction can be derived. For the young corrective therapist embarking on his career, such experience is invaluable.

Book Reviews

"Proceedings Los Angeles Conference on Health and Welfare," (Los Angeles: Institute of Industrial Relations, 1955. 32 pp.).

On February 5-6, 1955, the AFL and CIO unions in Los Angeles in cooperation with the Health Plan Consultants Committee met under the auspices of the Inter-University Labor Education Committee of the Fund for Adult Education to consider the health needs of union workers and their families. Their goal was stated to be "comprehensive medical care of high quality at a reasonable cost provided through prepayment." The text is composed principally of speeches made by representatives of the unions, of management and of medicine.

PJR

"Kinesiology," by Katharine F. Wells. 2nd Edition. (Philadelphia: W. B. Saunders Company, 1955. 516 pp. $5.50).

Here is one of the better texts in its field. Falling between the anatomical approach of Bowen and Stone and the functional approach of Morehouse and Cooper, it possesses something of the virtues of each, plus additional ones of its own. It is divided into four parts: Anatomic Fundamentals of Human Motion, The Mechanics of Human Motion, Underlying Principles of Basic Motor Skills, and Applications of Kinesiology. The chapter on "Selection and Classification of Principles Pertaining to the Prevention of Injury" has some "tips" which will be appreciated by Corrective Therapists teaching body mechanics in hospitals. Wells has abandoned the traditional "origin and insertion" in favor of "proximal and distal" in recognition of the fact that muscles do not always pull towards their origins—a move which seems eminently sensible. It is noted that the tensor fasciae latae is shown as a flexor, although the work of Wheatley and Jahnke has suggested that it might actually be an extensor. The author states that approximately half of the book has been rewritten. The text is profusely illustrated with line drawings and photographs. The bibliography seems especially well chosen. The First Edition was reviewed in the March-April 1953 edition of this JOURNAL. The Second Edition is even better. The book is highly recommended to physical education students and others interested in kinesiology.

PJR

"Recreation for the Handicapped," by Valerie V. Hunt. (New York: Prentice-Hall, Inc., 1953. 340 pp. $6.65).

To a great degree, says Hunt, a person achives a normal personality because of the growing, learning and maturing experiences of play. If the handicapped person is to develop a normal personality, he must have play experiences similar to those of the normal child. The goal of recreation is enjoyment from participation; because pleasurable experiences bring about a reduction of tension, recreation is therapeutic. From this philosophical basis the author goes on to consider recreation for the deaf, the blind, the diabetic, the orthopedically incapacitated, the neurologically incapacitated, the epileptic, the cardiac, the tuberular, the convalescent, the psychotic, the mentally defective, the mentally gifted and the aged. Each chapter begins with a brief description of the disease, considers its emotional and physical characteristics, and then develops the implications of these factors for recreation, including specific recommendations for activities. Additional chapters on Scouting, Camping, References, Notes and an Index complete the work. The book is one of the most clearly written and best organized texts that the reviewer has ever seen. It is not designed for Corrective Therapists (surprisingly enough the extensive bibliography does not list a single item from this **Journal**) and will be of little interest to them. They will, in fact, thoroughly disagree with some of the statements made. Veterans Administration employees may be perplexed over the reference (p. 215) to "recreational therapists" at Brentwood Hospital since this term is not used by the Civil Service. Actually these men were recreation leaders (sports). While the text recommends the study of unstructured dance for "recreationalists, music therapists and physicians," at Brentwood dancing as a therapeutic measure was developed almost entirely by the Corrective Therapists as was described in the August, 1950, issue of this **Journal.**

PJR

"Health for Effective Living," by Edward B. Johns, Wilfred C. Sutton and Wilfred C. Sutton. (New York: McGraw-Hill Book Company, Inc., 1954. 473 pp. $4.75).

"Health," say the authors, "is the quality, resulting from the total functioning of the individual, that empowers him to achieve a personally satisfying and socially useful life." Under the general title "Developing a Healthy Personality," mental health, including sex problems, is considered at some length, leading into chapters on selecting a mate, marriage and parenthood. Sections dealing with nutrition, selecting health services, diseases, alcohol, tobacco and narcotics, safety, etc. make up the rest of the book. Each chapter is

followed by a short bibliography of technical references and another of popular references. The scope of the book is designedly restricted by the fact that it is directed primarily at the college student (gerontology and geriatrics are scarcely mentioned) who is in search of information about himself and his environment. Within that framework it is excellent. The chapter on marriage particularly impresses the reviewer as comprising an eminently sane and practical discussion. The book should achieve a well deserved success as a text for college use. However, it does not require a college education to read it. The material is presented in a style which is both direct and clear. It may be recommended to any young adult seeking a guide through certain of life's pitfalls.

PJR

"The Human Machine," by Charles W. Shilling. 'Annapolis: United States Naval Institute, 1955. 292 pp. $4.50).

If a young man should ask a Corrective Therapist to recommend a non-technical book about the human body, he could hardly do better than to suggest "The Human Machine." In writing this as a text for the Department of Hygiene at the U. S. Naval Academy, Shilling has evidently asked himself, "What is it that young men want to know about their bodies?," and then (with the help of a few specialists) set out to answer his own question. The book is divided into three parts: The Construction and Operation of the Human Machine; Preventive Maintenance and Repair of the Human Machine, and The Human Machine as Part of the War Machine. As is to be expected, it shows its Naval background—material on marine biology, life in a submarine, military medical organization, etc. will certainly not be found in the conventional college textbook. Perhaps for that very reason it will prove the more interesting to the reader. It is profusely illustrated, but the captions on some of the illustrations are perplexing. Figure 48 shows an arm doing a reverse curl, but it is accompanied by an arrow pointing upward and a caption "extensor muscles." Figure 127 is labelled "Normal Arm Strength in Pushing Downward," but this is clearly taken from an illustration in Morehouse and Miller's "Physiology of Exercise," in which the caption reads "Maximum steady pull of forearm against a spring scale . . ." A very minor discrepancy would seem to be the use of a hyphen in Holger Nielsen. Figure 10 appears to be badly out of proportion. These points will no doubt be cleared up as the book goes into future editions. Of all the text books that have crossed this reviewer's desk, this is the only one he would recommend for enjoyable spare time reading. Try it. It's excellent.

PJR

"The Subnormal Mind," by Sir Cyril Burt. (London: The Oxford Press, 1955. 391 pp.).

This book is the third edition of a volume based upon the Heath Clark Lectures delivered in 1933 at the London School of Hygiene and Tropical Medicine. The author is a leading English psychologist who in this edition follows basically the 1935 edition in his classification of "subnormal" rather than mentally deficient which is the more modern term. The general subject material is introduced by a chapter on the normal followed by the subnormal mind. Other sections on delinquent and neurotic behavior could, in this reviewer's opinion, have been better included in a text on child psychiatry. The author bases his classification of "asthenic" and "sthenic" neuroses upon his own opinion that "a neurotic person is best described as subnormal rather than abnormal". His attitude toward dynamics as motivation for child behavior is clear in his statement "the greatest defect in present-day psychiatry is the fact that, unlike other branches of medicine, it rests on no generally agreed or scientifically established theory of the structures and functions with which it deals".

Although this volume may be of interest to the organically oriented psychologist, the semantic confusion inherent in the behavioral categories and the unacceptance by the author of modern dynamic concepts as responsible for a large part of childhood behavior will, no doubt, limit its acceptance by those disciplines interested in the "total" personality.

DCL

"Recreation As a Profession in the Southern Region," (New York: National Recreation Association, 1955. 210 pp.).

This is a significant report of a joint study by The National Recreation Association and The Southern Regional Education Board, 1952-54, including fourteen states, eight hundred and seventy five thousand miles and nearly forty-five million persons. It points out the general recreational needs of the South, the present and future extent of recreation leadership, the educational and economic status of workers and the type and level of education required for the preparation of such personnel.

Types of recreational programs reported include community, college, school, sectarian and non sectarian, mental and other hospitals, correctional institutions, rural, industrial and army service clubs. The various agencies—Community, State and Federal—utilizing recreational workers have established their own educational requirements of varying levels. Half of the institutions utilizing recreation agencies, however, do not require an academic major in this area, obout half having attained bachelor's degrees in physical education. The report concludes that it is reasonable to assume that college graduation with a major in recreation is now a desirable requirement.

Deficiencies noted in the present status of recreation as a profession in this region pertain to inadequate recruitment of personnel qualified to meet the professional course standard and the refinement and expansion of existing curricula to meet current recreational needs. When one realizes, for example, that seven schools providing graduate majors graduated only sixteen students with masters degrees in 1952, one can visualize the total inadequacy of existing educational facilities. A strengthening of present graduate programs in terms of added and better trained faculty, improved and intensive physical facilities, and a more comprehensive concept and practise of this modality in relationship to the psychological as well as social and physical needs of the individual will undoubtedly evolve from the present effort.

Corrective therapists have more than a passing interest in this development as they utilize many of the modalities of recreation as integral parts of their therapeutic armamentarium. It has been their experience that spontaneous, informal physical activities, organized within the framework of play and vitalized by its spirit may be modified to meet many and various therapeutic as well as social needs. The art is to refine these modifications for the specific purpose at hand. An evolving social statesmanship is pointing to the need for broad perspective as well as sharpened practise of recreational activities and this comprehensive report pointing out the present status of this development in The Southern States provides a wide vista for constructive planning and action for raising recreation to the status of an important profession.

JED

"Management of Addictions," by Edward Podolsky, M.D. (New York: Philosophical Library, Inc., 1955. 413 pp. $7.50).

This volume presents multiple viewpoints of leading authorities on the problems related to addiction to alcohol and the various drugs. Etiology is discussed from the dynamic, genetic and endocrine approach. Treatmen of alcoholism and drug addiction is onsiderecd at length with adequate details given of treatment methods. Among the authors of the various sections are: Karl Bowman, H. M. Cleckley, Oskar Diethelm and H. Edward Yaskin.

In this reviewer's opinion, this book is one of the best compilations of authoritative data which has been published on therapy of the addictions. Although written primarily for the physician, this book will provide a source of valuable information for the psychologist and sociologist as well.

DCL

BOOKS RECEIVED

"The Voice of Neurosis" by Paul J. Moses. (New York: Grune & Stratton, Inc. 1954. $4.00).

"Existence and Therapy" by Ulrich Sonnemann. (New York: Philosophical Library, 266 pp. $4.75).

"Exisential Psychoanalysis" by Jean-Paul Sartre. (New York: Philosophical Library, 266 pp. $4.75).

News and Comments

HOME TREATMENT IN TUBERCULOSIS

Veterans Administration doctors are pioneering a new program of treatment and rehabilitation for tuberculosis patients at the West Haven, Conn. VA Hospital, aimed at reducing substantially the hospital stay of selected TB cases.

The treatment, called "home chemotherapy," involves early discharge of the TB patient from the hospital as soon as the TB is not contagious.

West Haven VA doctors empasize that patients included in this program are highly selected. They must have the type of tuberculosis that responds well to prolonged treatment. In addition, each patient selected must have the economic, social and personal characteristics which make it probable he will continue to take drugs at home and return to the clinic for supervision.

The patient then is set up on a schedule of drugs which he arranges to receive outside the hospital, returning to the hospital's clinic periodically for a complete checkup. Hospital authorities even advise the return of the patient to his former employment, provided the work is not injurious to his condition.

In the past two years, under the supervision of Dr. Nicholas D. D'Esopo, chief of the TB service at West Haven, 200 selected patients were treated on the home chemotherapy plan. Seventy-five percent were afflicted with either minimal or moderately advanced TB. Also, 80 percent were under 40 years of age.

Of the 200 patients originally selected, 118 have finished the home drug treatment, and the other 82 still are in need of treatment.

Dr. D'Esopo's study has revealed that in patients with minimal disease, usually five months' hospitalization was necessary before the patients could be placed on the home therapy phase, whereas the moderately advanced group required 8.4 months of hospitalization and the far advanced, 11.2 months.

These periods of hospitalization, he said, apply only to patients admitted directly to West Haven. He found that patients transferred to West Haven from other TB hospitals required a stay of four to eight months longer, for reasons which are still under study.

In all three types of cases, an average of an additional six months of home chemotherapy is required after discharge from the hospital.

The study is being aided by a grant from the Connecticut Tuberculosis Association (Christmas Seals) for a two-year period.

In the way of rehabilitation, Dr. D'Esopo found that 82 percent of the original group became gainfully employed shortly after discharge. Of the remaining 18 percent, many are disabled in one way or another and will never work. The majority of those working are employed at their former jobs, many of them in their former places of employment.

Dr. D'Esopo said nothing has been observed in this particular type of home chemotherapy treatment to date to suggest the 200 selected patients are or have been a hazard to themselves or to the public health.

He stressed this special study which being made on highly selected cases, and that as yet this kind of treatment program could not be widely applied to tuberculosis patients in general.

VA doctors are cautious in appraising the future of the new treatment because of its relative newness. They prefer to continue their studies for three more years before making a positive forecast.

VA ANNOUNCES NEW EEG RESEARCH

A new Veterans Administration medical discovery about the human brain may account for some of man's little understood acts of violence which are committed without provocation.

The discovery indicates the root of the disorder may be located in the superficial layers of grey matter covering the brain — the cerebral cortex.

Until this finding was made, the theory linked the disorder with an epileptic disturbance in the deep structures of the brain — the hypothalamus — assumed by many to be the seat of emotion.

Dr. Chaskiel Grossman, director of the electroencephalographic laboratory at the VA neuropsychiatric hospital in Pittsburgh, who made the new findings, said the results of his studies pose two assumptions:

1. That some violent acts of destruction and murder may be related to a temporary or passing impairment of brain activity caused by a sudden blocking of the functions of higher discriminatory mechanisms, leaving the primitive emotions unchecked; and,

2. That immaturity of the brain, caused by a delay in the development of the superficial layers of grey matter, may be the basis of the disorder.

The immediate significance of Dr. Grossman's findings is that they point the way for further studies of the process of brain development to throw more light on some little understood acts of violence. He said they also call for extensive brain wave examinations of a large number of young persons with normal and abnormal behavior to make a final statistically significant evaluation possible.

Dr. Grossman is a specialist in "brain waves" as recorded in an electroencephalogram which measures electrical brain pulsations.

He said the abnormal brain waves seen in some individuals with unreasonable, violent behavior are different from those seen in normal persons, or those seen in persons with brain diseases, resulting from a stroke or a tumor.

These abnormal brain waves, Dr. Grossman said, are called technically positive "spikes" or ""bursts" and are labeled by some as "waves of violence."

The abnormal brain waves first were described in 1951 by researchers of the University of Illinois. Since then, many cases of unmotivated violence have been related to abnormal functioning of the brain as shown by the abnormal brain wave recording.

Significantly, accordingly to Dr. Grossman, the murder cases involved youngsters who killed a playmate, or a parent, and were described as especially cruel and without provocation.

Not much was known about the origin of these waves until recently Realizing it was of primary importance to reproduce this type of wave experimentally in animals, Dr Grossman, who had been engaged for many years in studies of the electrical activity of the brain of immature young animals, went to work on that phase of the research.

He found it possible to reproduce the characteristic waves in animals by blocking the function of the superficial layers of the grey matter covering the brain — the cerebral cortex.

The blocking occurred whenever certain drugs with a depressant action were applied to the cortex. The blocking was not permanent; it disappeared with the tapering off action of the drug.

It had been known previously that certain abnormal brain waves, including the so-called "violence waves," may be recorded while the patient is asleep. Dr. Grossman, using a special method of stimulation during sleep, was able to advance further this diagnostic procedure

The normal brain during sleep generates a special type of electrical response, called K complex, in response to a sudden stimulus. Studies performed by Dr. Grossman in 1948 at the VA hospital in Farmingham, Mass., revealed that patients with brain disease after a stroke or with a tumor show a difference in the form of this electrical response.

His latest findings show that patients with the so-called "violence waves" may reveal a different response from both the normal person and the patients suffering from brain disease in the ordinary sense.

This technique, he said, may help in the diagnosis of the abnormal response.

In summarizing his findings, Dr. Grossman said they do not support the theory that this type of brain wave and behavior is directly caused by epilepsy He added this is important since the implication that epilepsy is responsible for the state during which these criminal acts are performed may add a new social stigma to the epileptic.

"It should be noted that in contrast to the epileptic, the individuals with abnormal 'positive bursts' show not an aimless, but a well directed type of assaultiveness," Dr. Grossman said.

He added:

"It becomes apparent from these studies that a close relationship may exist between some cases of social delinquency and delayed physiological and anatomical development of the human brain. However, the final evaluation of this relationship and the full appreciation of these subtle development 'defects' are still difficult since our knowledge of the physiology of maturation of the human brain is largely spotty."

Extensive brain wave examinations of a large number of young persons with both normal and abnormal behavior also are necessary to make a statistically significant evaluation possible, Dr. Grossman said.

In conclusion, Dr Grossman said a recognition of the necessity of basic research in this neglected field is now slowly emerging.

"With further studies of the laws and principles underlying the process of brain development, elucidation of the mechanism governing some little understood acts of violence may become possible," Dr. Grossman said.

NEW PICTURE MAGAZINE

"The World the Handicapped Live In" is the subject of a new 30-page picture magazine just published by the Institute for the Crippled and Disabled, rehabilitation center at 23rd Street and First Avenue, in New York City. According to the Institute, this is the first time that the complete story of rehabilitation, as seen through the eyes of the disabled, has been presented for the enlightenment of the general public.

The purpose of the new "Thumbs Up", according to Willis C. Gorthy, Director of the Institute, is to bring about new understanding and awareness of the role that rehabilitation plays in helping the seriously handicapped to overcome the effects of disability through vocational training, medical care and psychological services geared together in a team effort designed to have maximum impact in combatting and overcoming the disability.

Copies of the publication are available without charge upon request to the Institute, Mr. Gorthy said.

The new publication was more than a year in preparation and its contents were screened by a committee of professional people representing all phases and activities in a comprehensive rehabilitation center. It contains more than 100 pictures which are presented in separate sections so as to point up the specific activities which the handicapped must be able to do in order to live in the world of the able-bodied. The titles for some of these sections are: "You're not part of this world till you can move in it", "It's a lonely world unless you can hear, speak, write", "You are only free when you can care for yourself".

The foreword to the issue pays special tribute to the hundreds of handicapped people who authorized their pictures to appear in order that, for the first time, the full story of the rehabilitation of the seriously disabled might be told.

NEW HOSPITAL FOR TOPEKA

Contract for the construction of a 1,000-bed neuropsychiatric hospital in Topeka, Kans., has been awarded to Peter Kiewit Sons' Co., of Omaha, Nebr., for $17,942,200, Veterans Administration announced.

The new VA hospital will replace the former Army Winter General Hospital in Topeka which VA took over in 1946.

The new hospital will consist of 21 buildings and will be built on 160 acres of land adjacent to the present VA hospital.

VA STATES POLICY

Chronic patients unable to care for themselves will not be discharged from Veterans Administration hospitals until arrangements for their care are completed with their families, local agencies or other sources.

This humane policy of many years' standing was reaffirmed in July by Dr. William S. Middleton, chief medical director.

Dr. Middleton said the hospitalization of an increasing load of veterans with chronic illnesses imposes "serious professional and administrative problems" on the VA hospital system.

He added these problems are even more profound in the case of a long term patients with terminal illnesses— that is, illnesses which may be asumed will ultimately result in their death.

Dr. Middleton has informed hospital managers that these cases not only demand the best professional judgement which may be given them, but also a humanitarian interest in their welfare after discharge.

He said particular care should be exercised concerning the disposition of patients with terminal illness. In case of question, the decision must be resolved in the best interest of the patient, he added.

Dr. Middleton said he was in accord with efforts to increase patient turnover and reduce length of hospital stay wherever possible, but these and other factors governing disposition of patients "must be subordinate" to the proper care and treatment of all patients, including those with chronic conditions.

Dr. Middleton has advised hospital managers to exercise extreme care that no chronic patient, unable to care for himself, is discharged unless the hospital management is assured through local arrangements that the patient will be adequately cared for by the family, local agencies, or other means, after discharge.

CONGRESS HOLDS POLIO SESSION

The Western Section, Congress of Physical Medicine and Rehabilitation held a symposium on Poliomyelitis on May 18 at the Hotel Statler, Los Angeles. The session, which marked the second annual meeting of the group, was chaired by Dr. John H. Aldes of Cedars of Lebanon Hospital.

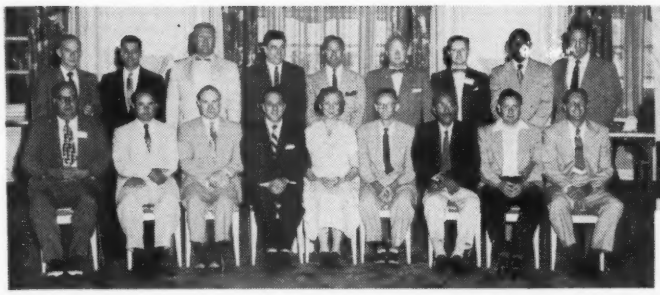
BLIND STUDENTS PLAY "BASEBALL."

Among the competitive sports played at the New York Institute for the Education of the Blind in the Bronx is a version of baseball devised by athletic coach Johnny Hordines. The game is played on a regulation softball field with special coaches stationed at first and third bases to aid the fielders. A soccer ball, painted yellow so that it may be seen by players who have useful vision, is used in the contest and it is batted from a tee at home plate. A regulation bat is used to strike the ball from the tee which stands 29 inches from the ground. Although younger players usually use a ball containing a bell to aid in detection, veteran players depend on air vibration to locate flies and often successfully catch them. Students who have useful vision are usually stationed in the outfield. The pitcher is stationed at the mound and acts as an auxiliary member of the infield.

SPONSOR THERAPEUTIC VETERANS CAMP IN WISCONSIN

The American Legion and the Department of Wisconsin have announced plans to jointly sponsor a therapeutic camp which will be available free to qualified veterans of the State who have been cleared by their own physicians for admission to the new program.

Camp American Legion, located on Little Tomahawk and Big Carr Lakes, has facilities including a main lodge and twenty-two cabins. It aims to provide a program of rest, recreational, and rehabilitation activities with the latter including all types of prescribed exercises, gait-training, self-care, and ambulation activities. The staff of the camp will include a physician, nurse, program director and corrective therapist who will be on duty at the facility from June 1 to September 1.



Lt. Gov. Summer D. Whittier of Mass. delivering the keynote address at the A.P.M.R Convention in Boston, June 28, 1955.

Above, THE BOARD OF GOVERNORS, A.P.M.R.: Seated, l. to r. Stanley H. Wertz, (Tenn.), Roger H. Wessel (N. Y.), Frank S. Deyoe (Mass.), Louis F. Mantovano (N. Y.), Eleanor B. Stone (N. Y.), Edward D. Friedman (N. J.), William Clark (Ala.), Paul Roland (Ill.), and Howard Barnes (Calif.),
Standing, l. to r. John F. Cullinan (Ohio), Gerald Le Houx (Pa), Bernard Weber (Calif.), Leslie M. Root (Wisc), Sam Boruchov (N. Y.), Paul Beck (Ga.), Vincent Anderson Mass.), Robert L. Davis (Ohio), and Chris Kopf (N. J.).

VA STUDYING MEMBER-EMPLOYEE PROGRAM

Long-term mental patients are being discharged as productive citizens through a new program of hospital job experience for pay, Veterans Administration announced today. This program, VA said, is succeeding where all other methods have failed.

Instituted less than a year ago after a two-year test, the program already has permitted the successful discharge of 111 chronic patients who apparently could not make the grade under any other existing method.

The project officially is known as the Member-Employee Program. It permits long-term patients, who otherwise are ready to leave the hospital, to become salaried hospital employees so they may be conditioned for the normal work and social experiences they will meet outside.

VA said the value of the program is that member-employees lose their identity as patients and become hospital employees in fact, with the staff helping them to make the difficult transition.

The combination of money as a reward for work and a normal social and work enviornment appears to overcome their fear of returning to the outside world after many years of hospitalization, VA said.

Member-Employes are paid a stipulated salary which they are free to spend as they wish. They live in the hospital section in which regular employes reside. They may come and go from the hospital as other employes do. And they are treated as employes, not as patients.

The jobs these member-employes fill are not made-work. They are regular civil service positions, governed by the same regulations that apply to regular employes.

In addition to salaries and quarters, member-employes are provided meals, laundry, and medical and dental care. This enables the staff to give them whatever medical attention they may need to make the transition from patient to employee easier.

Their job supervisors also help in the step-by-step period of adjustment through which member-employes learn to assume the responsibilities of salaried employes and thus gain confidence in their ability to hold a job successfully.

The program was developed and tested for two years (1952-54) by Dr. Peter A. Peffer while he was manager of the VA hospital at Perry Point, Md. He now is manager of the VA hospital at Brockton, Mass.

With the test a proven success, VA late last year authorized all of its neuropsychiatric hospitals having living quarters for employes to institute the program if they wished.

Since then, 19 neuropsychiatric hospitals have initiated the program. The latest figures available indicate 345 patients have been placed in hospital jobs, ranging from dental technician to messenger, under the program.

In addition to the 111 who already have left hospitals and apparently are making a good adjustment outside, 90 have been readmitted to the hospitals for additional treatment, and 144 still are working as member-employes.

Since the program is relatively new, VA said, further controlled research is needed to determine its effectiveness. However, considering the fact that patients chosen for the program are mainly those with long histories of mental illness and hospitalization, the results to date are encouraging, VA said.

DR. McINTYRE APPOINTED

Dr. Ross T. McIntyre, former chairman of the President's Committee on Employment of the Physically Handicapped, has been recently named executive director of the International College of Surgeons. Dr. McIntyre, a member of the Advisory Board of the Association for Physical and Mental Rehabilitation, was formerly surgeon general of the Navy and personal physician to the late President Franklin D. Roosevelt.

The HOYER *Patient*
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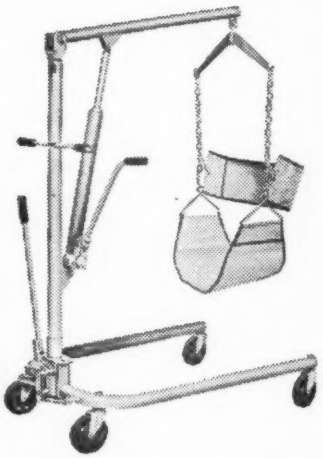

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AMENDMENT TO THE CONSTITUTION OF THE ASSOCIATION FOR PHYSICAL AND MENTAL REHABILITATION

The Board of Governors in a mail vote have approved the adoption of the amendment to Section 3 of the By-Laws of the Association for Physical and Mental Rehabilitation.

b. Annual membership dues shall be considered due on July 1 each year on a fiscal year basis.

c. In order to effect the change in date of membership dues on an equitable basis, there shall be published in the Journal and Newsletter for three (3) consecutive issues each, a chart and abstract explaining and showing the pro-rata basis for payment of said dues for the various expiration dates and the different types of membership.

The amendment goes into effect immediately and all the members will be expected to pay the amount shown on the table below by July 1, 1955. Those not complying within sixty days (by September 1, 1955) must pay the delinquency assessment of one dollar. Those who do not renew their active membership within six months of due date, January 1, 1955 and each year thereafter, will be dropped from the official roster and must apply as new members under the constitution to be readmitted.

TABLE SHOWING PRO-RATA PAYMENT OF DUES

DATE DUE	ACTIVE	PROFESSIONAL	ASSOCIATE
April 1955	12.50	6.25	5.00
May 1955	11.67	5.83	4.67
June 1955	10.83	5.42	4.33
July 1955	10.00	5.00	4.00
Aug. 1955	9.17	4.58	3.67
Sept. 1955	8.33	4.17	3.33
Oct. 1955	7.50	3.75	3.00
Nov. 1955	6.67	3.33	2.67
Dec. 1955	5.83	2.92	2.33
Jan. 1956	5.00	2.50	2.00
Feb. 1956	4.17	2.08	1.67
Mar. 1956	3.33	1.67	1.33
Apr. 1956	2.50	1.25	1.00
May 1956	1.67	.84	.67
June 1956	.83	.42	.33

It is of the utmost importance that all members cooperate in complying with the new amendment. We must keep our association on a sound financial basis and its operation on a high scale of efficiency. LET EVERYONE OF US BE ON TIME AND SEND OUR DUES TO THE MEMBERSHIP CHAIRMAN!

STANLEY H. WERTZ, *Secretary*

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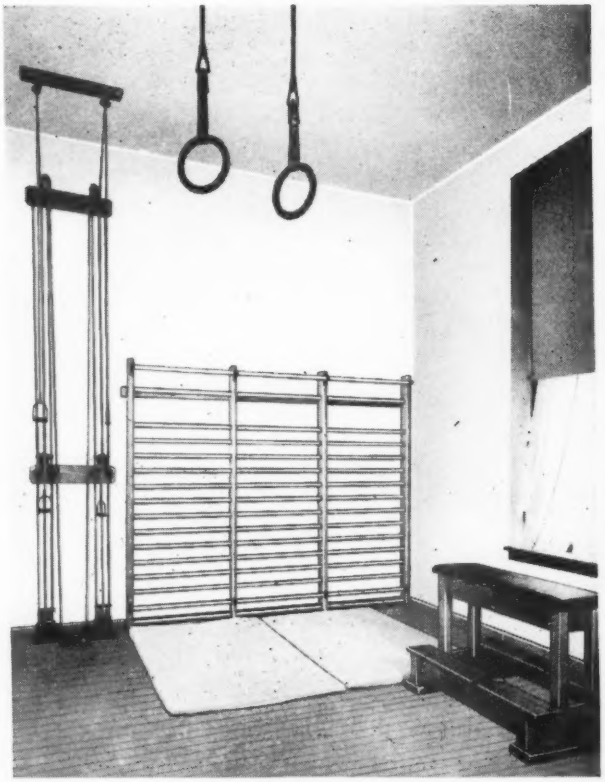

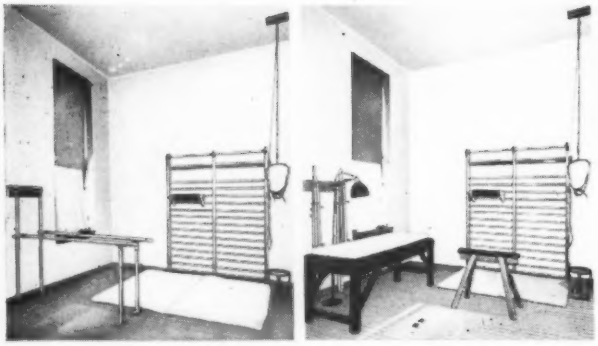

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